

Migration Pressure, Renewable Resource Scarcity, and Internal Armed Conflict

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1.0. Introduction

Environmental issues are increasingly on the international agenda. The rising awareness of problems created by global environmental degradation has been spurred by, amongst other things, the introduction of the concept of sustainable development by the International Union for the Conservation of Nature and Natural Resources (IUCN) in 1980, and gaining currency with the Brundtland report of 1987. Numerous scholars have, without reaching consensus on the issue, suggested or denied connections, between the fight for access to natural resources and the rise of tension and conflict (Hauge & Ellingsen 2001: 37). Relating environment and conflict, seems to be of growing interest. Many theoretical assumptions have been made about the relationship between environmental degradation and conflict; however, few empirical studies on the topic have given significant support to these suppositions. Quantitative large-N studies in particular, struggle to find strong connections between violent internal conflict and renewable resource scarcity (Urdal 2005; Theisen 2006). An important aspect of the environmental context is population, and migration is a crucial part of this.

Migration has been connected both to conflict and the environment mainly by the much-debated concept of “environmental refugees”. Myers’ predictions of a displaced population of at least 200 million people due to environmental strains have had great influence on the debate concerning such refugees. He has identified an emergent problem that, if correct, necessarily is of great significance (1997: 168). It is speculated that this phenomenon represents one of the potentially greatest human crises of our time, and that it is an “outward manifestation of profound change – a manifestation often marked by extreme deprivation, fear and despair” (Myers 1997: 181). The most widely repeated predictions of 200 million refugees are, however, contested, and the repetition in itself does not make the figure any more accurate (Brown 2007: 2). These refugees are claimed to be displaced because of environmental causes, whether abrupt or more subtle, but all due to environmental change.

Categorizing these people as such is in itself problematic, and may be misleading. Estimates of their number vary, as do their definition. Environmental change has always been a natural part of human adaptation to such change, and still is, a necessity. As a way of adjusting to these changes, people have historically migrated over smaller or larger areas to improve their predicaments. Although the consequences of environmental change might have accelerated, it is difficult to compare expected consequences to the extraordinary. Some downplay the urgency of the migration problematic by claiming that the migration effects of environmental distress may be absorbed by the urbanization trend. Such evolution may, however, in turn pose even larger challenges to potential local conflict levels.

Population *displacement* due to environmental degradation and change is an issue, but so is the impact of population *growth* on the environment, due to its potentially violent consequences. There are, however, conflicting views on the magnitude of population growth, and the projections vary accordingly. Recent history has arguably rejected the most extreme predictions, and there are even those who claim that the population growth is so much in decline that one claim to have “turned a corner on population growth” (Goldstone 2001: 96). The reasons for this may be an increase in education for women, the spread of economic development, and /or national and international support for policies of population planning (and accompanying movement along the demographic transition), which in turn has contributed to dropping fertility and population growth rates in different parts of the world. There is, however, no denying a considerable overall population increase. Considering moderate estimates of a rise to 9 billion people by 2050, and assuming international migration to remain at no more than a 3% of the world’s population, migration would increase to approximately 275 million in 2050. This growth is expected to be unevenly distributed, with less developed regions being particularly affected. Estimates suppose a global doubling of the age group 15-24, which traditionally are those most prone to migrate (Black et al. 2008). The consequences of population growth and the additional population pressure of migration is an obvious challenge. It will be crucial to establish an understanding of possible consequences of such likely future scenarios, particularly in a resource scarce

context. Weiner and Teitelbaum argue that “Population – its growth or decline, its movement, its density, its characteristics, its distribution – has always been linked to questions of security.” This entails that the movement of peoples has transformed societies, and both made and unmade states. In addition, population growth has been regarded a source of national power, or alternately been a contributor to disorder and violence. Contemplation following this same logic has grasped the attention of ancient and classical political philosophers and commentators (2001: ix). Environmental issues have also been incorporated into security thinking, and have at times been labelled “the new security issue”. This perspective is clarified by the reasoning of Myers:

If a nation's environmental foundations are depleted, its economy will steadily decline, its social fabric deteriorate, and its political structure become destabilized. The outcome is all too likely to be conflict, whether conflict in the form of disorder and insurrection within the nation, or tensions and hostilities with other nations (Myers 1986: 251).

Threats to security are thus being more broadly defined today than in the past. Environmental security is an unconventional *source* of threat, though the threat of conflict remains a conventional concern. Homer-Dixon provoked great concern and controversy when claiming that we are on the verge of an era where environmental change will more frequently trigger conflict, if not be the primary source of insecurity (Goldstone 2001: 84-88). Despite the consequential security thinking, Homer-Dixon himself argues that the environment-security theme incorporates an almost unmanageable range of sub-issues, especially if the security term is broadly defined. He recommends a narrowing down of the research question to primarily investigating conflict rather than security, however still claiming the topic being too vast (1991: 76-77). Even though armed conflict in the world today is at a historic low, and that there has been a decline in conflict throughout the post-war era, recent years show an escalation in armed conflict world wide. This recent increase is suggested due to intrastate rather, than interstate conflict (Eriksson & Wallenstein 2004: 625). Several

scholars agree that our understanding of the potential security risk that is posed by environmental degradation is increasingly complex and are marked by a pattern of conflicts *within* countries, rather than interstate conflicts (Ohlsson 1999; Deudney 1990; Homer-Dixon 1999). Ohlsson argues that in the wake of the genocide in Rwanda in 1994, the Director of USAID, Brian Atwood, noting that issues of natural resources are frequently critical to achieving political and economic stability, while also identifying disintegrated societies and failed states as the greatest menace to global stability, took the first step of identifying the new pattern of conflicts in the world (Ohlsson 1999: 26).

Identifying environmental degradation as a security issue is in its own right no given. Not all scholars agree that this status is well earned. Barnett argues that environmental change and its impact on social and ecological systems, together with a post cold war fluid international security environment, encourages environmental degradations to be viewed as a security concern (2001: 2). Although emphasising interstate conflict, Deudney admits that given the trend of deteriorating environment as a consequence of the accelerating race toward higher standards of living, environmental issues are likely to “become an increasingly important dimension of political life at all levels” (1990: 461). However, he severely doubts the link between environmental degradation and national security. Deudney claims that this upgrade to a national security concern is owed primarily to the traditional focus on national security, and it being a main feature when it comes to both intrastate and interstate conflict (1990: 461). Suhrke has an almost normative approach to the question of environmental security. When referring to the history of migration, she argues that migrants and refugees may represent victims, assets, or threats. By selecting the most negative dimension “the security paradigm is likely to reinforce popular stereotypes of migrants as undesirable and dangerous, even if the analyst does not draw this conclusion” (1997: 256, see also Weiner 1993; 1995). This does not render the security paradigm obsolete in this context, but requires that it is treated with caution, particularly when it comes to the suitability to empirical material (Suhrke 1997: 256).

This Master's thesis starts from the neo-Malthusian assumption that demographic change (mainly population growth) and resource scarcity, are important sources of armed conflict. Demographic factors have arguably been linked to conflict from time immemorial. Demographic aggression is thus by no means a new concept, although demographic variables and forms of demographic aggression vary over time and place (Weiner and Teitelbaum 2001: 46). In this thesis, the main demographic variable of interest is migration pressure, operationalized as refugees, and the context is that of resource scarcity. Measuring migration pressure through refugees captures sudden increases in population relative to the access of renewable resources in a better way than by looking at general population density or growth. The supposition is that sharp increases in competition over resources caused by sudden increase in migration will place heavy burdens on the physical environment.

The forms of aggression studied are both low and high intensity conflicts, and include non-state and state actors. A broadened definition of conflict avoids a limitation to conventional conflict, and provides a broader test of the neo-Malthusian argument. There are theoretical reasons for assuming increased occurrence of minor rather than major conflicts as a result of environmental factors (Homer-Dixon 1995: 12)¹. It can also be argued that the most likely type of conflict to emerge is one internal to countries. This entails that the supposed intensity of a conflict can be lower both due to an expectation that the actors involved are less organized and equipped than those in conventional conflicts, and that the context of the conflict, suffering from scarcity of important resources, possibly represents strain on conflict activity in its own right². This is accounted for in this thesis by defining conflict at a low intensity level (25

¹ Homer-Dixon and Blitt investigates both state- and non-state conflict, but does not noteworthy distinguish between the two. In the publication "Ecoviolence" the conventional conflicts in Gaza, Chappas and Rwanda are investigated, as are the non-state conflicts of Pakistan and South Africa (1998).

² The indirect mortality rate can nonetheless be quite high under these circumstances. Conflict in an already precarious environmental context can have fatal consequences for civilians and combatants alike (e.g. Darfur).

battle-related deaths per year) than what is commonly used in civil-war studies (1000 battle deaths), and by including non-conventional conflict, where the state is not an active party to the conflict. The study will take the form of a large-N quantitative cross-national time-series study, covering the period 1950-2007. The unit of analysis is the country-year. The dependent variable is armed conflict onset. Migration pressure, renewable resource scarcity and international presence, are all central independent variables. The main focus is thus; the effects of migration on conflict in a resource scarce context. The causal relationship between migration and scarcity is assumed to have a mutually reinforcing positive effect on the outbreak of conflict. This study is restricted to domestic conflict, and does not consider interstate conflict. International aid is expected to have a mediating, or at least negative effect on this relationship. The focal point of the thesis is reflected in the following general hypothesis, later to be specified in two sub-hypotheses:

Migration pressure has a greater impact on the probability of conflict the greater the level of renewable resource scarcity.

The interaction of migration and resource scarcity in potentially causing conflict, have so far not been thoroughly investigated, leaving room for the contribution of this Master's Thesis. The focus on migration pressure where resources are scarce, and its implications on the risk of conflict, is an interesting topic. Migration, as well as resource scarcity, is by many understood as increasing, and it is important to explore whether the conjunction of these two phenomena is likely to spur conflict. To investigate these possible connections, the analysis will as mentioned use a quantitative design. Although few large-N studies find strong relationships between renewable resource scarcity and internal conflict, this thesis may be justified both by the alternative causal connections it investigates, and by the use of relatively new and diverse data, particularly considering the inclusion of low-intensity and non-state conflict.

2.0. Theory

‘Environmental refugees’ seem to be naturally associated with the subject of environmental degradation and migration. This concept has become progressively noticeable, and the term continues to gain way both in the contemporary climate-debate and among scholars. The estimated number of environmental refugees is disputed, as are the definitions of *who* exactly qualifies to constitute this population. Estimating the magnitude of environmental migration is almost impossible, or difficult at best (Suhrke 1993: 33). The definitional boundaries of refugee-generating environmental changes have varied, ranging from “sudden natural disasters to gradual natural disasters to human-induced disasters.” (Lee 2001: 55) Although there seems to be little doubt that environmental disruption contributes to large population displacement, how to determine its scale with certainty remains a challenge (Lee 2001: 55-58). There is an admission of the fact there is no “mono-causal relationship between climate change, disasters and displacement” (NRC 2009: 5). Although, it is recognized that there *does* exist a link between the phenomena. The distinction between involuntary and voluntary migration is controversial, yet essential (Suhrke 1991: 9). This distinction is used to contrast environmental refugees from migrants. Where environmental refugees respond to push factors, migrants act based on a combination of pull and push factors. Refugees, thereby, flee relatively unprepared compared to migrants (Suhrke 1991: 9-10). While voluntary migration is an obvious adaptation strategy, climate change and disasters may also cause forced displacement that is essential for survival (NRC 2009: 5). United Nations Development Programme (UNEP) researcher El-Hinnawi first defined environmental refugees as:

[...] those people who have been forced to leave their traditional habitat, temporarily or permanently, because of a marked environmental disruption (natural and/or triggered by people) that jeopardized their existence and/or seriously affected the quality of their life [sic]. By ‘environmental disruption’ in this definition is meant any physical, chemical, and/or biological changes in the

ecosystem (or resource base) that render it, temporarily or permanently, unsuitable to support human life. (El-Hinnawi 1985: 4).

Environmental changes may lead to different kinds of migration, depending on the characteristics of these changes, and resulting in acute versus slow onset of environmentally induced migration (Zolberg and Benda 2001). The urgency of migration due to extreme weather may lead to more temporary displacement than displacements provoked by slower processes, such as rising sea levels. State capacity may influence the mere scale of the migration, as well as possibilities for repatriation. Bear in mind that when discussing refugees in this study, these are categorized as such in the more traditional sense of the word.

2.1. Scarcity and conflict

Many theoretical arguments derive from the original work of Thomas Malthus, and connect population pressure to conflict. This postulates the simple, but profound, notion that while food production grows linearly, population increases tends to be exponential (Tir & Diehl 2001: 61). “All of us who ponder the questions of the human environment are the intellectual descendants of Thomas Robert Malthus”, no matter if one should agree on his teachings or not (Kates 1996: 45). The theoretical framework of this thesis will explore the neo-Malthusian presumption of the unsustainability of food-production and population growth. Contemporary understanding of population and resource issues can be said to derive from three principal dimensions of concern: Malthusian, Marxist and Ecological. Malthus assumed that the number of people would grow at a geometric rate³, thereby overwhelming the resources that are

3 “Geometric growth refers to the situation where successive changes in a population differ by a constant *ratio* (OECD)” [Emphasis added].

expanding only at an arithmetic rate⁴. Continuations of this demographic pessimism are the Marxists. Although refuting the Malthusian premise, this view defines the population problem in terms of distribution. It is argued that existing resources will be sufficient, if only they are properly utilized and distributed. This will be achieved through a transformation from capitalism to socialism. The Ecologists brought forth the implications of ecological factors on the political and economic failure or success of a nation. Meadows and Meadows' book *The Limits to Growth* (1972) was a benchmark in this regard. This perspective challenges the inevitability of continued industrialization, from where most ecological pressure stems (Lee 2001: 8-9). Political ecologists consider resource-related conflicts to be primarily motivated by structural inequalities, rather than "natural" scarcities and population growth (Kahl 2006: 23).

Environmental depletion is assumed to further hurry these incompatible developments. Many environmental scarcity models widely rely on the assumptions of relative deprivation theory. This implies that renewable resource scarcity will encourage socio-economic grievances that eventually result in conflict (Theisen 2008: 814-815). This is further specified by Ohlsson, who defines the general understanding of the Malthusian dilemma as:

[...] great and global processes of change that follow from continuing large population increases, rising developmental expectations, the unavoidable environmental impacts that follow as these expectations gradually are realized, and the consequences, in turn, for people as their societies are put to such severe strains resulting from these large processes of change that their very ability to fulfil the undeniable right to better lives for their populations is threatened, ultimately entailing risk of violent conflict (Ohlsson 1999: 3).

The works of Homer-Dixon and the Toronto Group are placed within the relative deprivation tradition in conflict theory. The core concept of Homer-Dixon's work is

4 Distinct from the concept above. Increase by a constant *number* (OECD).

environmental scarcity, distinguished by three dimensions. The *supply-induced scarcity* dimension implies that the availability of a renewable resource is reduced faster than its regeneration. *Demand-induced scarcity* results from growth in population or increase in per capita consumption. *Structural scarcity* occurs where resources are inequitably distributed and rest in possession of a privileged minority, while the remaining population suffers from resource shortage (Homer-Dixon 1994). *Environmental scarcity* is a product of these parts working in conjunction. The Toronto Group emphasises that any treatment the fundamental issue of resource renewable resource scarcity should “encompass the exhaustive set of scarcity’s resources: decreases in supply, increases in demand and changes in distribution (Schwartz, Deligiannis and Homer-Dixon 2001. 276).” These different categories of scarcity interact and are mutually reinforcing, resulting in two social processes designated ‘resource capture’ and ‘ecological marginalization’. The latter occurs when population groups faced with resource scarcity migrate into areas with fragile eco-systems, which in turn generates greater scarcities in the given area as well as deprivation conflicts between locals and newcomers (Homer-Dixon 1999). Concerning ‘resource capture’, there is arguably a social inequality effect caused by society’s powerful, resulting in ecological marginalization of the less advantaged (Ohlsson 1999: 38).

None of these theoretical assumptions, however, go unchallenged. The Malthusian analysis has been somewhat discredited mainly as a consequence of remarkable augmentation in food production and our capacity to both exploit and transform our environment (Weiner and Teitelbaum 2001: ix). Julian Simon represents one of the leading advocates of the school of thought that does not consider population increase to be as dangerous. By this he challenges the basic assumption that population growth inevitably leads to resource scarcity. The argument is that most resources are not genuinely fixed in the economic sense, and are therefore not likely to diminish due to rising population. Resources are valuable only for the ‘services’ they provide. Because the resources we exploit are perpetually changing, resources are not finite. The ultimate scarce resource is claimed to be human ingenuity (1981; 1996). There are

nevertheless difficulties concerning this “optimist” view. First of all, it largely discards the lag-time between population pressure and necessary technological adjustments, and the fact that these will vary across countries and regions. Secondly, technological innovation is both unequally distributed and accessible in time and space. Finally, the assumption that technological advancement will be the salvation to population growth is argued to be “neither sufficiently justified theoretically nor entirely confirmed empirically” (Tir & Diehl 2001: 65-66).

Political economy as a field, including the views of Malthus, has been accused of tending to “reduce everything to social construction, blatantly disregarding all that is not human” (Greenberg & Park 1994: 1). Political ecologists generally claim to consider both cultural and political activity within an analysis of ecosystems, considered to be significantly, yet not entirely social constructs. For political *ecologists* ‘the environment’ ranges from the predominantly cultural, through the intensely political to the considerably natural (ibid: 8). Peluso and Watts reject automatic and oversimplified linkages between increased environmental scarcity, decreased economic activity, migration, and the resulting violence and conflict that Homer-Dixon and his colleagues (the Toronto group) are accused of. They consider violence to be the product of local histories and social relations, while still very much being part of larger processes of power relations and material transformation. The importance of *patterns of accumulation* is emphasised. These patterns are formed by a structured political economy, which differentiates positions of, and access to, resources (Peluso & Watts 2001: 5). Peluso and Watts refuse scarcity to have monopoly over violence, which they consider a claim of Homer-Dixon’s. Both resource scarcity and abundance alike can provoke violence. They call for more thorough investigation of the ways in which environmental violence disguises and reflects other forms of social struggle (ibid: 5-8). Political ecology generally argues that environmental issues become ‘socialized’ when collective resources are controlled by local groups at the expense of others. This again forces management interventions by private firms, state agents or development authorities. By the same logic, conflicts

within and between communities are ‘ecologized’ by conservation or resource development policies (Robbins 2004: 14). Elements of environmental issues are increasingly present, but hidden by the perpetrators and observers of violence equally. The legacy of Malthus and the like is considered more of a curse than anything. Peluso and Watts understand the predictions and causalities behind environmental scarcity and conflict as provoked by a “deep fear of the poor and their claims to resources, despite radical changes in the world since Malthus’ time (Peluso & Watts 2001: 5-8).

Studies conducted by Homer-Dixon and the Toronto Group, have been under heavy scrutiny (Gleditsch & Urdal 2002; Gleditsch 1998). It is claimed that when these investigate the relationships between environment and conflict, there is little or no variation in neither the dependent nor the independent variable. This is because the literature is mainly based on case studies, where both stress on the environment and armed conflict are or have been present. This makes generalizations difficult (Hauge and Ellingsen 2001: 37-40). Some argue that most empirical findings from environment-conflict case analyses acknowledge an interaction and mutual stimulation of conflict and environment, and thereby conclude that little, if any, conflict can be strictly defined as *environmental* conflict (Lee 2001). Another problem is that the concept of environmental scarcity in itself is based on other factors than environmental degradation. The idea of structural scarcity, for instance, is concerned with the unequal distribution of resources and is in large part a product of politics. The politics of distribution is accused of disappearing in the overarching environmental scarcity concept (Hauge and Ellingsen 2001: 37-40).

Appreciating the complexity of the environment-conflict nexus, Homer-Dixon restricts his research ambitions. Rather than evaluating the whole spectre of independent variables, he weighs the seriousness of the processes or pathways whereby the environment may affect the degree of dependent variables. Despite these precautions, Lee states that while the environment is merely one of many causally significant

factors in the complex conditions of conflict, it is still reasonable to claim that “with intensifying environmental decline, violent conflict involving environmental components has been noticeably increasing” (2001: 5-6). The Toronto group in general, is accused of failing to contribute to the understanding of the causal pathway to domestic armed conflict by ignoring more direct linkages between these conflicts, and political and economic factors. Gleditsch’s (1998) critique of Homer-Dixon and the Toronto group is mainly rooted in methodological concerns, such as inappropriate selection of cases, the neglect of the possibility for reverse causation, devising untestable models, lacking tools to weigh causal variables and overemphasising the complexity of ecological-political systems. This critique to Homer-Dixon represent a “methodological straightjacket that would, if widely adopted, severely constrain research in the field” (Schwartz, Deligiannis and Homer-Dixon 2001: 273-274). It is further argued that these deep methodological issues “can only be understood in the context of Gleditsch’s unduly narrow perspective on what constitutes systematic research (Schwartz, Deligiannis & Homer-Dixon 2001: 280)”. Homer-Dixon and colleagues defend their methodology by emphasizing the difference between causal effect and causal mechanism. Neither the single-case nor experimental and quasi-experimental method is sufficient in revealing any causation with absolute certainty. The single-case method is even so a necessary instrument to demonstrate causation (Schwartz, Deligiannis & Homer-Dixon 2001: 282).

More fundamentally, the relative importance of renewable resource scarcity and depletion remains debated (Theisen 2006: 5). The focus on the degradation of renewable resources is, on a theoretical level, reinforced by the concept of the “tragedy of the commons”. This illustrates a mechanism whereby natural resources, not yet subjected to social management or regulation, apparently inevitably are depleted due to an increase in demand, particularly from population growth. This tragedy occurs mainly in periods of rapid change, when social systems’ capacity to adapt has proven insufficient, or when regimes of resource management have been challenged by competing modes of production (Ohlsson 1999: 18). Gurr even argues that scarcity

seldom is an objective fact, but rather is a social construct shaped by people's perception, given that scarcity rarely exists as an absolute fact. "Scarcity as a social or political problem is largely defined by people's perception of the lack of a resource in terms of their image of the good life" (Welch & Miewald 1983: 10). However, Gurr argues that ecological scarcity could breed gradual impoverishment, creating material inequalities both within and among societies. These inequalities are, in turn, claimed to intensify class cleavages, ethnic hostilities and conflicts (1985). Defining scarcity like this diverts somewhat from the more commonly used economic conception of resource scarcity (Gurr 1985: 55). Ohlsson also stresses the relative nature of 'scarcity'. Although a seemingly straightforward concept, indicating "a situation where there is insufficient amount of a particular resource or asset to satisfy normal requirements". Determining what is 'normal' and how that norm has evolved, however, is highly problematic. Considering the concept of scarcity as a social construct, and to acknowledge it as such, is to "recognize the impact of cultural change on material needs" (1999: 3-4).

The very urgency of resource depletion problematic is scrutinized by the notion of human abilities of adaptation. Ingenuity is important in order to be able to handle resource scarcity and environmental degradation successfully. The ongoing debates present diverting opinions on what may inspire the necessary creativity. Boserup (1965) argues that in agriculturally dependent societies, the mere pressure on resources will necessarily lead to both innovation and economic diversification. de Soysa further reasons that the abundance of resources (be that non-renewable or renewable) *obstructs* incentives for innovation. This is because states become less dependent upon skilled labour by collecting the majority of its revenues from resource rents, and thereby under-develop human capital, considered to be the most important determinant for economic growth (de Soysa 2002, 2005). As a result of ever increasing resource consumption, population growth and resource access, resource substitution and conservation tasks will become ever more urgent, significantly increasing the need for ingenuity (Homer-Dixon 1999: 26). Societies need to adapt by ingenuity, and both

understand and act on links between environmental scarcity and violence, and its negative social effects (Homer-Dixon 1999: 107). With necessity being the mother of all invention, there will be an assumed increase in ingenuity that will help alleviate scarcity's severity and social impacts (Homer-Dixon 1999: 108).

Homer-Dixon admits that the answers concerning what affects a society's ability to supply much needed ingenuity, is highly complex. Ingenuity is relative to many factors, such as social, political, economic and cultural characteristics of the different countries, and these respond to scarcity in different ways. Homer-Dixon claims that with a rise in both population and per capita resource consumption, in addition to persistent inequalities in resource access; renewable resource scarcity will affect especially poor countries with "unprecedented severity, speed and scale" (Homer-Dixon 1999: 26). This need is however challenged by influences and circumstances such as limited access to capital, brain drain, incompetent bureaucracies, generally weak states and corrupt judicial systems. In addition, the supply of ingenuity can be limited by stresses generated by the very resource insufficiency it envisioned to solve. There is said to be an "ingenuity gap" where the "requirement for ingenuity to deal with environmental scarcity rises while their supply of ingenuity stagnates or drops" (Homer-Dixon 1999: 26-27).

The argument continues that in poorly governed countries, and especially those with a history of conflict, there is also a lack of incentives to invest both time and labour in the conservation of resources. Combined with low government interest and investment in rural areas, bad governance is held to be the causal mechanism behind both resource degradation and civil war (de Soysa 2002, 2005). Other scholars also emphasize government resources and the quality of institutions as key determinants of whether or not increasing scarcity will lead to conflict (Kahl 2006). Raleigh and Urdal argue that compared to all economic, political and social factors, environmental and demographic stress is not likely to be an equally important risk factor. The first mentioned factors are considered to not only determine the state capacity to adapt, but also largely mould

the general opportunities for rebel groups to succeed (2007: 676).

Gleditsch argues that politics have a mediating effect on the environment and conflict relationship⁵. Everything else being equal, democracies have a more “enlightened environmental behaviour”. Democracies are claimed to be more responsive to those affected by environmental degradation, and are also more prone to actively cooperate internationally in order to alleviate environmental problems (2001: 57). The importance of state capacity is stressed to be a determinant of the impact of migration. Kahl recognises two causal pathways from demographic and environmental stress, understood as resource scarcity, and violent conflict⁶. These causal arguments are ‘state-centric’, and form the hypothesis of *state exploitation* and *state failure*. The latter meaning a weakening of the state. This in turn heightens the potential gain from a rebellion compared to the likely costs a state is able to inflict on the rebels, and thereby an increase risk of conflict is to be expected (ibid 2006: 47). Demographic and environmental stress may negatively interfere with a state’s functional capacity by costly demands placed to remedy strains on the agricultural sector, and needs for social improvements (Kahl 2006: 40-43).

State capacity may be considered a reflection of its vulnerability. Vulnerability is by the Intergovernmental Panel on Climate Change (IPCC) defined as “the degree, to which a system is susceptible to, and unable to cope with, adverse effects of climate change, including climate viability and extremes” (2001: 995). This concept thereby captures both the risk and degree of exposure, as well as the ability to handle the

⁵ Gleditsch also claims that politics influence the very manner in which conflicts are acted out. This reasoning stems from the concept of democratic peace (See: Gleditsch & Hegre 1997; Raknerud & Hegre 1997). This concept is however considered to lie outside the scope of this Thesis.

⁶ Armed conflict is throughout this thesis defined with a lower threshold of 25 annual battle-deaths, as used in the Uppsala dataset (Gleditsch et al., 2002; datasets available at <http://www.prio.no/cwp/datasets>).

challenges imposed by the environment. Social cohesion may be put to the test by diverting understandings of the best response to challenges of resource scarcity, put forward by competing parties. An undermining of overall economic activity may generally contribute negatively to both a states functional capacity and its abilities of social cohesion (Kahl 2006: 40-43). Even when demographic and environmental factors are *not* the drivers behind state failure, such factors contribute to a relative weakening of the state and these are considered more perceptible to conflict over resource scarcity. This increased risk of conflict is both due to the states inability to mitigate effects of resource scarcity, and because they are overall more likely to be militarily challenged by opposition groups (Raleigh & Urdal 2007: 679). While large migrations stem from environmental problems, a future migration crisis is equally a crisis of social, political and economic sorts, that mirrors institutional systems' inabilities to effectively reflect unique and deep-seated changes, such as this (Myers 1997: 181).

Homer-Dixon does in fact acknowledge the importance of context. Environmental scarcity is never a sole or sufficient cause of violence, poverty or large migrations. Environmental scarcity is assumed to always interact with other economic, political and social factors to produce the social effects described above (Homer-Dixon 1999: 16). This implies that for conflict to break out as a result of environmental factors, it takes more than solely environmental degradation, or resource scarcity. The adaptive capacity of the state in particular and society in general, is crucial (Ohlsson 1999: 48). Given an environmental issue, however, "there must be both an opportunity and a clearly perceived advantage of taking to arms" (ibid: 48). As claimed by Homer-Dixon, countries experiencing rapid growth in population are dependent on adaptation to be able to avoid conflict in comparison to countries with a high but stable population-to-resource ratio (Homer-Dixon 1999). Moreover, Homer-Dixon explicitly emphasises the heightened possibility for conflict outbreak *within*, rather than *between* states. "These environmental scarcities do not cause wars among countries, but they

can generate severe social stresses within countries, helping to stimulate sub national insurgencies, ethnic clashes, and urban unrests” (Homer-Dixon 1999: 12).

Hauge and Ellingsen have found that economic and political factors are the strongest predictors of conflict, but that environmental and demographic factors nonetheless have impact (1998). Kahl addresses this by arguing that by way of economic, ecological and social effects, population and environmental pressure reverberate into politics that by state failure and state exploitation, turn into pathways to civil strife (2006: 29-30). The state may instigate conflict in their advantage by focusing on migrants. Rejecting the migrant population may be used in order to gain popularity and support from the domestic population. Suhrke argues that this role may be reversed by the state aligning itself with the displaced. Such scenarios are considered more likely in situations where the support of a displaced group is determined on grounds of ethnic politics or economics (Suhrke 1993: 28). This underlines the alleged critical relationship between “the migrant, the refugee and the state”. The potential for acute conflict thereby lies in the migrant population’s ability to gain support and make demands (Suhrke 1997: 270).

In a quite opposite scenario, and in the absence of state intervention, refugees generated and driven by environmental pressures tend to be victims, rather than threats. These migrants are weakened, disempowered and dispersed, and pose no immediate threat. They are claimed to make few effective demands on the receiving area, and their most urgent needs are commonly met by international relief. Social exploitation, rather than blatant social conflict, takes place (Suhrke 1997: 270).

Raleigh and Urdal emphasise difficulties in testing the opportunity aspect of a state exploitation. As derived from Kahl’s (2006) concepts of such a potential role of a state, one can imagine a state instrumentally using resource scarcity as a means to bolster support. Encouraging (e.g. inter-ethnic) conflict over resources, may contribute to divert attention from state incapability of meeting domestic demands. Though theoretically appealing, Raleigh and Urdal argue that the hypothesis is too vaguely

defined to be able to isolate effects and test by statistical analysis (2007: 679-680). Homer-Dixon is also aware that environmental degradation in itself is an insufficient cause of violence, recognizing the importance of economic, political and social factors. He is, however, concerned that scholars may “swing to the opposite extreme” of what he himself been accused for, namely underestimating important contextual factors. First of all, environmental scarcity can itself affect social factors like institutions and policies in harmful ways, and not only the other way around. Secondly, mere physical characteristics of the society’s surrounding environment can be a factor. Lastly, once environmental scarcity becomes irreversible, it is as if by definition, an external influence on society (Homer-Dixon 1999: 17).

2.2. Migration and Resource Scarcity

Migration has naturally always existed, but scholars seem to agree that there, for different *and* controversial reasons, has been an increase at least in forced migration, across and within international border (Wood 1994; Castles & Miller 2005). Millions of migrants and refugees, and their hopes for freedom from violence and repression are coincidentally matched by the fears of states and their citizens, that a massive influx of newcomers will impose strains on the economy, upset a possible precarious ethnic balance, weaken national identity or threaten political upheaval (Weiner and Teitelbaum 2001: 107-108). Whether or not these governmental concerns are justifiable is difficult to assess, although perhaps not from the lack of trying. Comprehensive and generalisable theories are considered to remain elusive. Linkages between demography and security, and their predictive implications, have been linked to theory, but intervening variables between causes and consequences, highly contextual outcomes and data limitations, are accused of confounding empirical analysis (Weiner and Russell 2001: 16).

Cause and effect relationships between environmental degradation and migration are difficult to quantify, and are considered tied to political, cultural and economic factors (Zolberg and Benda 2001: 44). Migration may be both a cause and effect of worsening environmental conditions. There may be overlapping environmental, economic and political push factors, as well as pull factors in the receiving area determining whether, when and where to move (Buhaug et al: 2008: 21). Although the *causes* of migration are not pivotal to this particular study, the points made are nevertheless useful.

Reasons to flee can be many. Traditionally, as acknowledged by the United Nations, refugees are those who migrate in fear of being persecuted because of “race, religion, nationality, membership of a particular social group, or political opinion (UNHCR 1951: Article 1)”. This definition assumes across-border migration, as does the operationalization of migration pressure in this Thesis’ analysis. The widely accepted definition of a refugee, is thereby someone fleeing from war or conflict, having crossed an internationally acknowledged border and usually granted political asylum. Distinguishing a refugee from a voluntary migrant is imperative.

It is the reluctance to uproot oneself, and the absence of positive original motivations to settle elsewhere, which characterises all refugee decisions and distinguishes the refugee from the voluntary migrant (Kunz1973: 130 in Hugo 1996: 109).

There are two different forms of migration that are considered somewhat intertwined. Voluntary migration is motivated by several influences derived from economic, political and ideological reasoning, but also considering environmental factors. Forced migration may stem from direct environmental factors that create unbearable living conditions, but this degradation may in its own turn be a product of underlying economic and political factors. Following this same logic, Unruh, Krol and Kliot more precisely define that migration triggered from conflict caused by resource depletion, “does not occur because of the direct consequence of environmental change but rather as a result of a complex series of interlinked (“snowballing”) factors in which single clear-cut cause-to-effect relations may not be identifiable” (2004: VIII). In such a perspective, the distinction between economic and environmental refugees is not

straightforward. Further blurring these particular motivations is the notion of eco-migrants; “eco” stemming from both the term ecology and that of economy. Eco-migrant is an even more indistinct concept than the “environmental refugee”. Eco-migrants include those voluntarily moving to new areas in order to exploit natural resources. However, these same people are often forced to leave, as resources on which they depend are severely degraded or destroyed (Zolberg and Benda 2001: 47).

Many scholars have attempted to nuance migration. Buhaug, Gleditsch and Theisen differentiate between rapid and gradual, and permanent or temporary migration. These differentiations are influenced by the speed of the perceived environmental pull and push factors. A further distinction is made by identifying those who flee from immediate dangers, and separate from those who travel over longer distances with hopes of a better future in a different area (2008: 27). When discussing complex issues of what can lead to migration of populations, Unruh, Krol and Kliot claim an important distinction between voluntary and forced migration (2004: VIII). Olson added the dimension of physical danger, which is environmentally induced, to the established premise of persecution. He defines refugees, and thereby forced migration, as follows:

Refugees differ from other, spontaneous or sponsored migrants, largely in the circumstances of their movement out of one area to another, and the effects these have on them in the settlement and adjustment phases of their relocation. Refugees are forced to leave their homes because of a change in their environment which makes it impossible to continue life as they have known it. They are coerced by an external force to leave their homes and go elsewhere (1979: 130 in Hugo 1996: 107).

Salehyan also differentiates types of migration, distinguishing between environmental migrants and 'classic' refugees. It is claimed that environmental refugees do not have political agendas, unlike refugees that flee from conflict zones and that are inclined to make political demands and have an interest in the conflict outcome of their native countries. If environmental degradation leads to conflict and thereby forces migration, then these refugees are assumed to have a greater propensity to provoke conflict in the receiving area (2005: 13). There have been several studies that consider the nature of migrants, whether being environmentally induced or driven by conflict, to be a determinant on the risk of conflict in a receiving country (Forsberg 2009a; Salehyan 2005; Buhaug & Gleditsch 2008). However, it is far from obvious that the *reasons* for migration will have significant security implications for the host area. Lack of conceptual clarity and data limitations has restricted the opportunity to empirically study the possible impacts of environmental migration across cases (Buhaug et al. 2008: 28). What constitutes a refugee might not be sufficiently defined through formal specifications, but presumes a subjective understanding of the situation.

Motives for flight are normally associated with conflict. Although present in earlier literature, the influence of environmental factors on refugee flows, has received increasing attention. One may distinguish between the environment as primary objective for fleeing, and the environment being an accessory interacting with other motivating factors. Unruh, Krol and Kliot speak of forced migration as being "one of the direct or indirect effects of global environmental change (2004: VII)." They further argue that such migration, leading to what they call environmental refugees most likely will have significant social, economic and political consequences. They predict a political and economic tension raised explicitly by an increase in the number of refugees that in turn may lead to conflict situations. This conflict potential spurs from most contemporary governments ability to deal with such a situation (ibid). Zolberg and Benda claim that the primary push factor is political, and not environmental (2001: 46). Weiner argues that there are further trends that demonstrate an increase in internal conflicts, much due to ethnic conflict. Wars between states remain a diminishing, but

nevertheless significant source of refugee flows. It is also found that the number of refugees produced increases far more rapidly than the number of countries producing refugees, implying an increase in refugees per conflict. This increase is claimed to be a consequence of the natural population increase in countries of origin, the availability of arms on both sides of a conflict lowering the bar of taking to arms, and the increased use of antipersonnel mines causing menace toward the population that persist even past the original conflict's end (1996: 6, 25-26).

Lee argues that, as hypothesised from a neo-Malthusian perspective, high population density within nations may per se cause social disintegration and, at the extreme, increase the risk of violent conflict over limited resources. Additional population pressure in already overpopulated areas, such as Third World countries are often aggravated by large-scale flows of migrants and refugees (Lee 2001: 11-13). Understandings of the term 'overpopulation' is however not a given. This stems from the acknowledgement of the fact that there is no intuitively ideal ratio between population and resources. Limiting overpopulation to the Third World is also misleading, as developing countries may well be far less densely populated, and still have the capacity to absorb these. Goldstone insists on the security implications of population change, even with a possible decrease in population growth (Goldstone 2001: 96-97). The importance of agriculture and access to resources is also emphasised:

Many countries may well experience collisions between their agrarian populations and access to land, between the expansion of their labour force, educated aspiring elites, urban population, and youth cohorts and the absorption rate of their economies, and [...] between migrants and resident populations that inflame ethnic and regional tension (Goldstone 2001: 99).

Concerns of both population growth and resource constraints are rejected by Boserup (1981) who holds that these are vital to promote technological progress.

‘Cornucopians’ such as Boserup and Simon, reject the Malthusian assumption that population promotes resource scarcity and promotes civil strife. Concerning agriculture for instance, Boserup expects a parallel progression in agricultural technology as pressure on the land increases (Boserup 1981). Simon (1996) argues that resource depletion is avoided through the technological process. It seems an increase in population is understood as an increase in people to innovate.

Migration is at large considered to be an intermediate stage linking environmental degradation to conflict (Homer-Dixon 1991; 1994). One may speculate that refugee populations increase conflict risk given a scenario of an overwhelming of local services, and provoking violence and resentment in receiving areas. Suhrke, however, claims that such expectations belong in the realm of local fears, rather than in social reality (Suhrke 1993: 34). She claims it is a common misperception that conflict will ensue when people are displaced, and argues that this can only be the case in zero-sum interaction, however actual or perceived (1997: 257-258). Weiner and Teitelbaum, however, see a conflict potential proper to refugee populations. There is a real concern that massive flows of refugees offer a setting where aggressive states and non-state actors may strategically ‘place’ their operative’s sensitive locations abroad (2001: 108). Also Forsberg underlines such conflict risk assigned to refugees in particular, investigating possible contagion effects between refugees and neighbouring countries (2009a). Looking at the spread of conflict through migration-flows is encouraged by evidence suggesting that ethnic conflicts, and thereby also ethnic groups, are not customarily confined within the borders of one particular state, implying transnational linkages between ethnic groups involved in conflict and group members living in a neighbouring country (Forsberg 2009a: 25-26).

Even though developed societies are less susceptible to environmental stress triggered by increased population pressure, most refugees migrate between developing countries. In such areas, relatively small numbers of refugees may present significant challenges, generating enormous pressures. Given the magnitude of global environmental damage, the contribution to environmental degradation caused by refugees may be minimal. Even so, unexpected increases in population may be a challenge to the ecological balance in the affected area, and this in turn may generate economic and social strains (Lee 2001: 110-112). Taking this reasoning even further, one may contemplate that in extreme these 'strains' may result in violent conflict. Where the number of refugees is high, and their stay prolonged, refugees increase the rate of resource consumption and depletion, which accelerates environmental degradation (ibid). This leads to intensified competition between the native and the newly arrived populations over scarce land and resources, and may again lead to further migration. The conclusion drawn from this strain of thought is that environmental and/or political crises producing cross-border refugees may well generate "other refugee-producing environmental changes and/or conflicts in a receiving nation" (ibid).

Dramatic growth in cross-border population movement manifests itself all over the world. This growth mostly occurs between developing countries, often already strained on resources. There are conflicting perceptions of exactly what may happen after refugees arrive in a host country. Lee distinguishes between "combatant" and "non-combatant refugees". Other than obvious conflict-generating qualities of combatant refugees, the last category raises challenges of its own. The non-combatant refugees may arguably become politicized and build their own community, and thereby accelerating existing internal instability in the host state, when the possibility of returning home in the near future is slim (2001: 109). This prediction differs significantly from that of those who believe that a longer stay in the host country will stimulate more or less harmonic integration in the receiving state.

Reuveny identifies at least four complementary processes relating what he calls “climate-induced migration” to conflict. These four processes leading from migration to conflict are *competition* by the burdening of the economic and resource base in the receiving area; *ethnic tension* both between migrants and residents or by ethnic divides despite nationality; *distrust* between the host and receiving area; and *fault lines* following existing socioeconomic patterns (Reuveny 2007: 659). In identifying these processes to receiving areas that are particularly prone to conflict, Reuveny stresses the impact and potential tension caused by migration. It is not unreasonable to suggest that such strains on receiving areas may expect levels of unrest, if not straight out conflict. In Reuveny study, which has a self acclaimed Malthusian taste, it is nuanced that although *not* to overrule the possibility of conflict, climate-induced migration does not have to lead to conflict. Migration can even benefit the absorbing area by e.g. increasing the workforce and tax-base (2007: 660). Lee argues along the same lines, that the political balance in a state or area may be rocked by the multiple consequences of changes in demographics resulting from migration (Lee 2001: 14). She argues that in multiethnic and heterogenic societies burdened by conflict among contending linguistic, ethnic, or religious groupings, foreign populations may disturb domestic equilibrium. The argument is that given the crucial part demographic factors play in a democratic process and the political framework of “one person, one vote”, locals may believe to lose political domination over their own land (ibid.). The Swiss research project ‘Environment and Conflict’ (ENCOP) also recognizes the conflict potential in migration and environmental scarcity. This project claims that demographically induced conflict appears when and where there are clear contradictions between economic and ecological carrying capacity. Indicators of this become visible through “shrinking per-capita allotments of arable land”. This is also the underlying assumption in this Thesis’ empirical analysis, and the operationalization of the resource scarcity variable. The first hypothesis explores the relationships of migration pressure, resource scarcity and violent conflict.

Hypothesis I: Migration pressure is particularly likely to increase the risk of conflict in the context of increasing renewable resource scarcity.

2.3. The Impact of Migration on Different Types of Violence

It is claimed to have been found empirical evidence relating both to the positive causal relationship between environmental scarcity and conflict, but also to the very nature of conflict. Homer-Dixon claims that environmental scarcity rarely leads directly to interstate conflict, as states are unable to quickly and with ease convert renewable resources into assets that importantly augment their power. In addition, the countries that depend the most on renewable resources tend to be poor and therefore have fewer capabilities for aggression (Homer-Dixon 2001; 1994; 1999). Scarcities limit already fragile societies' ability to cope with negative changes in the access of resources, by the additional stress this imposes, and thereby reducing both agricultural and economic activity, ultimately weakening the state (Homer-Dixon & Blitt, 1998: 280f). Thereby; "environmental scarcity is mainly an *indirect* cause of violence, and this violence is *internal* to countries (Homer-Dixon 1999: 18)." In this context, conflict is characterized as tending to be "persistent, diffuse, and sub-national." This type of conflict is anticipated to increase intensively in the coming decades, under the assumption that scarcities rapidly worsen in several parts of the world (Homer-Dixon 1994: 39). Smaller, rather than larger conflicts are considered more interesting in this setting (Homer-Dixon 1994; 1995). This claim has found empirical bearing besides the authors of this claim. Hauge and Ellingsen, after operationalizing Homer-Dixon's *Environmental Scarcity*, demonstrates that environmental degradation seems to have a stronger impact on the incidence of smaller rather than larger armed conflicts (1998). The increased possibility of relatively local conflicts at low-intensity levels may in the long run have severe implications. Salehyan and Gleditsch claim that periods of low-intensity conflicts, in practice, are "likely to be associated with a higher likelihood of future large-scale conflict (2006: 350)."

Fighting a government army requires great organizational efforts and considerable resources. From this perspective, it may be argued that conflicts between non-state actors (non-state conflicts) are more likely to occur, given that these parties are affected to a greater extent by environmental scarcities, compared to a given

government. The potential underground involvement of a government should however not be underestimated (Theisen & Brandsegg 2007: 6)⁷. The traditional focus on interstate and civil wars when investigating resource scarcity and conflict is criticized. The argument is that there is an “inverse relationship between the importance of scarce resources and the scale of conflict”. This implies a call of attention to lower-level conflicts, not presuming the state as an active part (ibid 2007: 2). Given that non-state conflict is understood as a breach of the state monopoly of the use of force, the event of such conflicts must somehow indicate a silent permission from the state, or an inability to prevent it (ibid: 6). Theisen assumes that in a conflict over resources, one should expect that non-state conflicts be most likely, relative to those where the state is an active part. On the premise that scarcity leads to grievances and poverty, deprived groups will be too weak to engage in conflict with state forces (2006: 35). Suliman argues that scarcity is most important to more local and smaller conflicts, where the state is not necessarily an active part. These ‘local in clinch’ have a more peripheral status relative conflicts of the state, as these conflicts are less likely to evolve into full-scale civil wars (1999b). Given the state’s neglect of economically less significant areas, the void of a mitigating third party is filled by local rule. Historically cooperative bonds between groups are weakened in parallel to the increase of scarcity. Upsurges of conflict between neighbouring groups can be caused by e.g. the ‘desert versus the oasis syndrome’, where one group inhabits a relatively more fertile eco-zone than the other (ibid. 1999b: 187). These premises result in the following hypothesis, implying the nature of conflict.

Hypothesis II: Violent conflict resulting from the interaction between migration pressure and renewable resource scarcity, is of a low-intensity nature, and does not presuppose government involvement.

Suhrke emphasises that where displacement becomes long-term, the conflict potential rises in parallel to the migrant population’s acquired autonomy or influential

⁷ Although, this is beyond the scope of this thesis.

allegiances. A prevail over the powerlessness inherent with the refugee or migrant status, will allow an increase in demand to their hosts. Also, gradual migration is expected to have potentially violent outcomes, and as such, migration may have a cumulative effect that may place additional stress on already fragile political and social systems (1997: 263-264). The neo-Malthusian logic of resource depletion is followed when emphasising that population size and density, as well as individual consumption, escalate the shortage of resources and environmental degradation. With increasingly scarce resources, more expensive and environmentally damaging processes are required in order to provide resources for additional people. Such ecological stress can launch fierce competition among the affected population, and possibly lead to violent conflict. Lee argues that there are several stages a society may go through before resorting to violence. To be able to clarify the evolution of such conflicts enables the anticipation of “a new dimension of global insecurity”, according to Lee (2001: 21).

2.4. Migration and International Aid

There is an articulated need for the international community to mitigate and adapt to possible large-scale displacement (Brown 2007: 29). There is reason to believe that the mere presence of a third party may have a calming effect on a country's conflict level. This will, of course, to large extent also depend on the kind of presence. One could contemplate that a strong economic presence of third parties would provide an economic incentive to keep domestic peace, out of consideration for foreign investments. United Nations agencies and Non-Governmental Organizations (NGOs) may have more explicit interests in peace, as these third parties are used to obtain exactly this and mediate between conflicting parties. By explicit mandates aimed at both preventing and restraining conflict, they already have attentiveness, and an alert concerning precarious situations. In particular, humanitarian refugee assistance may be of importance for lowering domestic conflict levels, not only amongst the migrants themselves, but also in meeting with the population in the host area.

There is nevertheless no ignoring the controversy on the subject, and there is no clear understanding of how different kinds of presence might influence outcomes. In *this* Thesis, official development aid will be investigated. The perspective of aid's mediating effect, on resource scarcity in particular, is challenged by claims of relief agencies and host government policies unknowingly fuelling conditions under which resource use conflict may result in violence (Suliman 1999a). Counter-intuitively to popular belief, humanitarian assistance to refugees may have exacerbating effects on conflict (Lischer 2003: 5). Tarp and Hjertholm stress that humanitarian aid may both intensify and prolong conflict when fallen into the hands of belligerents. The giving of aid to combatants based in refugee camps is another problem, and a longstanding one at that. However, it is emphasised that the unintended support of combatants is not the fault of humanitarian aid per se, but stems from the failing security for its delivery (2000: 306-307). The effects *and* effectiveness of foreign aid as a stabilizer in and after conflict is obviously controversial, and when intended effects fail to materialise, frustration and disillusion may follow.

[t]o be very candid...who the hell cared about Rwanda? Who really comprehends that more people were killed, injured ad displaced in three and a half months in Rwanda than in the whole of Yugoslavian campaign, in which we poured sixty thousand troops and more. The whole of the Western world is there- we're pouring billions in there... (Gourevitch 1998 in Tarp and Hjertholm 2000: 316).

Studies show that foreign aid at least reduces the duration of conflict, and it is claimed that foreign aid may be an important tool for policy-makers and aid agencies alike, in preventing future conflict (Ree and Nillesen 2006: 17). Aid can claim to be important in limiting the intensity-level in conflict between locals and migrants. This may be enabled through the establishment of structures created in order to reach different groups. Organisations can enjoy greater trust among local groups, relative to the

current government. Suhrke argues that international relief does indeed have a mediating effect on conflict, by tending to a migrant population's most immediate needs, and thereby releasing receiving areas of this additional potential strain. This is suggested to reduce the conflict potential in a given area (1997: 270).

As Kahl (2006), Salehyan also stresses the importance of the state, and its mitigating effects on environmental degradation and conflict, but adds an emphasis to the urgency of international donor assistance to countries (especially developing countries) experiencing deteriorating environmental conditions. Given the interaction of poverty and environmental stress, more severe outcomes are to be expected relative to areas with better resources for crisis management. The recommended international assistance does not necessarily stem from altruistic motives. Generous assistance programs restrain potential and actual emigration at its source, and is considered considerably more efficient than reactive immigration enforcement initiatives (2005: 15-16). Myers, a pioneer in the environmental refugee problematic, was sure to emphasise foreign aid when presenting his influential predictions of potential displacement. He stressed the importance of aid reaching the main countries and regions of concern to the likely future production of environmental refugees. He claimed that these regions hosted the poorest of the poor, and estimated that this would "relieve the problem while it is still becoming a problem, i.e., before it becomes entrenched". Those in absolute poverty are most likely to migrate as a result of environmental distress (1997: 178). Fundamentally however, it is of crucial importance to suitably recognize, comprehend and respond to the issue by dealing with the assumed sources of the problem, rather than reacting to its symptoms (ibid: 181).

The assumption in this thesis is that international aid will have a mitigating effect on the conflict potential in a country. The data used in this analysis is based on official development assistance (ODA) and official aid donations (per capita). One may argue that such contributions are relatively less likely to stray, be more efficiently spent and

have the opportunity to finance bigger projects than private donations. This is however not certain.

Hypothesis III: International presence reduces the risk of conflict due to migration pressure in resource scarce areas.

3.0. Research Design and Data

Tying together the theoretical assumptions that underlie this thesis' hypotheses, including concerns about the nature of conflicts, is a neo-Malthusian perspective on population pressure, the relevance of resource scarcity, and an expectation that the causal relationships between these elements are measurable and statistically significant. One of the, perhaps, most controversial aspects of these theories is resource scarcity, which is heavily advocated by Homer-Dixon and colleagues as having a legitimate independent causal role:

Scholars and policymakers must take into account the independent causal role of environmental scarcity if they are to understand and respond to many important cases of civil violence around the world (Schwartz, Deligiannis and Homer-Dixon 2001: 278)

The primary objective of my master thesis is, as mentioned, to investigate the relationship between migration pressure, resource scarcity and violent conflict. By applying a quantitative research design and using Stata software, I will analyze how added migration pressures in areas where renewable resources are scarce affect the probability of violent conflict (both conventional and non-conventional). Whether international aid can mediate the risk of conflict is also examined.

Data have been collected and compiled from already existing datasets. These sources are the Uppsala University and the Peace Research Institute Oslo (PRIO), the United Nations Population Division, Urdal (2005), Gleditsch et al. (2002), Salehyan and Gleditsch (2007) and the United States Committee for Refugees and Immigrants (USCRI). The time-series is 1950-2007, the 2007-limit being determined by the dependent variable (non-state conflict), which unfortunately is not updated further. However, the observations are overall so many, and the time-span of such length, that

this will suffice for a thorough analysis. The units of analysis are limited to those used in the dataset of the dependent variable, which are the same countries that base the PRIO armed conflict dataset. The amount of units of analysis is considered sufficient for the purpose of this thesis.

3.1. Previous Empirical Studies

Previous empirical (quantitative) research on the subject of migration, environment and conflict, have produced a diversity of findings. Although there have been conducted studies on all the main relationships presented in this thesis, the combination factor is what justifies this particular study. The resource scarcity and conflict nexus seems to be increasingly debated parallel to its rise on the political agenda. Gleditsch (1998) more generally comments the literature by emphasising that despite an abundance of declarations on the relationship between environment and conflict, there is, as of yet, no consensus considering the causal mechanisms neither empirically nor theoretically (ibid: 383-384)⁸. Homer-Dixon claims to find evidence of noteworthy relationships between resource scarcity and conflict. Both his theoretical and empirical findings have however been equally criticized (Gleditsch 1998; Gleditsch & Urdal 2002; Homer-Dixon 1994; 1995; 1999; Homer-Dixon & Blitt 1998; Peluso & Watts 2001). The notion of ‘conflict’ is often operationalized as civil war. This may be due to empirical studies finding insignificant correlation(s) between the outbreak of war *between* states and resource scarcity. It is recognized that although resource scarcity is frequently considered a theoretical source of intergovernmental conflict, this is rarely supported empirically. A pioneer study that quantitatively investigates the relationship between resource scarcity and the incidence of internal armed conflict is Hauge and Ellingsen (1998), also focusing on neo-Malthusian reasoning. These find that freshwater scarcity, land degradation, population density and deforestation increase the risk of civil conflict. Also de Soysa (2002) has found support for a link

⁸ This is also highlighted in Tir and Diehl (1998), where the literature suggests a link between population variables and international conflict (interstate conflict).

between high population density and internal armed conflict using large cross-national time-series studies. However, empirical research has, so far, failed to find unanimous evidence for a resource scarcity and conflict scenario. Even in an attempt to replicate the study of Hauge and Ellingsen (1998), Theisen (2006) did not find the empirical evidence to support the claims of the original authors.

Despite population growth and density being associated with increased risk, Raleigh and Urdal (2007) find that the effects of political and economic factors far outweigh those between demographic and environmental factors at the local level, and conflict. The effects of land degradation and water scarcity are weak or insignificant. Claims of a 'new era of insecurity' following the end of the Cold War, is by Urdal (2005) found to have little empirical support, and the suppositions of environmental, and demographic factors threatening security and state stability are thereby unfounded. Boserup's (1965) general findings rather points to population pressure as a prerequisite for modernization as it gives rise to economies of scale, and in a later study finds that scarcity of arable land at an aggregate level appeared to reduce the risk of conflict (1981). Myers (1992) voices the notion of steep population growth and a discontinuous process of environmental change. This entails the degradation of a given resource exploited at a given level, until the exploitation exhausts the self-renewable capacity of that resource (Myers 1992: 116).

Influxes of refugees into an area can cause considerable stress on natural resources, leading to both environmental and social impacts (UNHCR 1996; Black & Sessay 1997) Focusing on environmentally induced migration (environmental refugees) a major and interesting conclusion in Suhrke's study is that insofar as environmental degradation causes displacement of people, it is more likely to generate exploitation rather than conflict (1993: 35). Salehyan and Gleditsch quantitatively link refugee migration to civil conflict in receiving states (2006). There are presented several interpretations of this. Economic and resource competition, disruption of a previous

ethnic balance, and the spreading of arms and ideologies all hold explanatory powers. Hugo emphasises the international dimension of the migration-environment relationship, which he assumes to be of increasing significance. He investigates the relationship between migration and the environment, and calls for increased international involvement (1996). Raleigh, Jordan and Salehyan consider the impact environmental change has on migration and conflict. They argue that changes in migration patterns due to the environment, is highly unlikely. They further claim that environmental migration tends to be short term and internal, and the potential for instigating conflict is low (2008). Weiner and Teitelbaum (2001) argue that it is appropriate to suggest a connection between demography and levels of violence, given that that worldwide increase in displaced populations such as refugee flows and internally displaced persons have been among the most notable developments over the past quarter century (ibid: 51).

3.2. Method: Logistic Regression

Given that the dependent variable is dichotomous with the values conflict (1) and non-conflict (0), the most suitable methodological design is a maximum likelihood logistic model. The dependent variable is two-fold, entailing individual analysis of both conventional conflict and non-state conflict. The relationships between the dependent and the independent variables are not expected to be linear; as such a regression model would suppose possibilities for predicting values of Y outside the 0-1 interval. The aim of the analysis is to investigate how the share of having a particular value on the dependent variable varies for different values on the independent variables. Shares can by definition only vary between 0 and 1, so answering to this; these are transformed to log odds of having a particular value on the dependent variable. The logarithmic transformation extends the range of the dependent variable from $-\infty$ to $+\infty$ (Skog 2007: 351-366). The challenge lies in finding (co)variations between the units, and

find significant correlations between the dependent and independent variables. A logistic model can be written as (ibid: 358):

$$\tilde{Y} = \frac{1}{1 + e^{-(b_0 + b_1 \cdot X)}}$$

To facilitate interpretation of correlation between variables, odds ratio, rather than log odds are applied⁹. Odds ratios are the antilogarithms of the log odds (the regression coefficients). Odds ratio measures the relative change in the odds of having the value 1 in the dependent variable resulting from a one unit increase in an explanatory variable, controlled for all other variables (Skog 2007: 364-365).

3.3. Time-Series Regression Analysis

Time-series analysis allows studying successive variations in the dependent variable at one or several observation units over longer periods of time. This method can help determine the nature of the effects the independent variables have on the dependent, and may determine whether these are durable or temporary phenomenon's, and whether they emerge gradually or abruptly (Skog 2007: 82). A commonly used definition of this type of analysis argues that "time series analysis accounts for the fact that data points taken over time may have an internal structure (such as autocorrelation, trend or seasonal variation) that should be accounted for" (NIST/SEMATECH). Time-series analysis includes a spectrum of exploratory and hypothesis testing methods that have two main goals. The first goal involves identifying the nature of the phenomenon represented by the sequence of observation. The second goal represents an ability to forecast (predicting future values of the

⁹ Implies the use of the 'logistic' rather than 'logit' command in the statistical tool Stata.

variable), based on the previous time-series. Both of these goals assume an identification of pattern(s), and a formal description of these (StatSoft)¹⁰.

3.4. Operationalization of variables

3.3.1. Dependent Variable

3.3.1.1. Violent Conflict

The dependent variables are based on two Uppsala/PRIO conflict datasets entailing both conventional and non-state conflict. For these two ‘Violent Conflict’ variables there is a lowered intensity requirement of 25 battle-related deaths per year, rather than the traditional limit of 1000. Conventional conflict data presupposes “a contested incompatibility that concerns government and/or territory where the use of armed force¹¹ between two parties, of which at least one is the government of a state” (Gleditsch et al. 2001: 619). Non-state conflict understands the 25 battle-related death minimum as results of “the use of armed force between two organized armed groups, neither of which is the government of a state, which results in at least 25 battle-related deaths in a year” (UCDP 2009). The lowered battle-related death criteria is not only due to the data alone, but is very much motivated by theoretical arguments that imply that the kind of conflict to be expected in a resource scarce setting is that of low-intensity. These data reflect conventional, as well as non-state conflict. The last

¹⁰ This type of data is often complimented by cross-sectional analysis in order to reduce the risk of spurious correlations due to underlying factors that represent problems in the analysis of some variables, is not present, or at least less present with other units of observation (Skog 2007: 83). This is also done in this analysis, although the comments on this follow in footnotes, as it is considered but a valuable *supplement*.

¹¹ The ‘use of armed force’ may need further specification and refers to the “use of arms in order to promote the parties’ general position in the conflict resulting in deaths (the UCDP/PRIO Armed Conflict Dataset Codebook Version 4-2009: 1).” ‘Arms’ concern “any material means, e.g. manufactured weapons but also sticks, stones, fire, water etc (ibid)”.

mentioned type of conflict may in itself allow a more thorough registration of conflict relevant to the principal independent variable of renewable resource scarcity.

The conventional conflicts available by UCDP/PRIO use the common civil war operationalization-procedure for coding ‘onset’. This entails coding every outbreak of conflict either as a result of entirely new conflicts, or if two or more years have passed since casualties were below the required level. When considering ‘onset’, the different conflicts within a country will not be taken into account, and the outbreak of a conflict, be they related or not, always needs to meet the 2-year requirement of fewer than 25 battle-related deaths. If there are observed several outbreaks of conflict in the same year, the first actual outbreak will set the basis for the evaluation of the 2-year “peace” criteria. The dependent variable conflict onset, is coded 1 for the first year of a conflict and 0 if no conflict takes place in the state in that particular year (dichotomous). Subsequent ongoing years of the same conflict are dropped from the estimation sample. In cases where there are multiple conflict onsets in a country, data on a new onset is included if it occurred during the years when another conflict was ongoing (Salehyan & Gleditsch 2006)¹². Reliable data below a two-year limit of inactivity is considered difficult, although there is no authoritative answer to how conflict should be coded (Strand 2006: 9).

The dependent variable indicating non-state conflicts were initially thought to also measure onset. However, given that the data does not specify the end of a conflict and that there are only available data for five years, this is difficult¹³. Therefore, non-state conflicts are coded by incidence. The amount of conflicts in a given year will not be

¹² Alternative measures of coding new ‘onset’ cases when new rebel groups enter the conflict, have been estimated by Salehyan & Gleditsch, resulting in insignificant variations of results (2006: 350 n. 45).

¹³ This information, together with other updates, will be available in the updated version of this dataset due in August of this year. The data will then also cover the years from 1989 throughout 2009

taken into account. The variable is coded 1 in the case of conflict, and otherwise holds the value of 0. These data are limited to sufficiently few years, so that issues of time-dependency are limited. In addition, countries with conflict in the first year of registered data (2002) would be coded as ‘onset’ while it is probable to assume that all of these did not break out then.

3.4.2. Independent Variables

3.4.2.1. Migration Pressure

Migration is a complex phenomenon, and thereby poses difficulties for reasonable operationalizations of the concept. Aware of these challenges however, and the necessary limitations following the operationalization, I am fairly confident in having found a sufficiently explanatory measure. This study is not concerned with a state’s population per se, but rather the additional demographic pressure as a factor external to natural population growth. Variations of the proportions of this additional pressure over time, and investigated relative to the availability of arable land is what is of interest, as it is the *scarcity* of resources that is hypothesised as paramount to the likelihood of the outbreak of conflict. Migration pressure is hereby operationalized as forced migration, and is defined by the United Nations High Commissioner for Refugees (UNHCR) as:

[A person] owing to well-founded fear of being persecuted for reasons of race, religion, nationality, membership of a particular social group or political opinion, is outside the country of his nationality and is unable or, owing to such fear, is unwilling to avail himself of the protection of that country; or who, not having a nationality and being outside the country of his former habitual residence as a result of such events, is unable or, owing to such fear, is

unwilling to return to it (Article 1, The 1951 Convention Relating to the Status of Refugees).

The focus in this thesis is forced migration crossing borders, namely refugees, however, their reasons for fleeing being of less importance. The refugee data used in this thesis stems from two different sources, as the time-series vary, and these will be investigated separately. Salehyan and Gleditsch's "Replication data for refugees and the spread of civil war" (2007) and the Centre for Systemic Peace's (CSP) data on "forcibly displaced populations, 1964-2008" (USCRI, annual). The former dataset have gathered information from the Population Data Unit of the UN and the High Commission for Refugees (UNHCR) and cover the years 1946 until 2003 (the time-series of this analysis begins in 1950). The refugee data made available by CSP and compiled by USCRI, spans from 1964 until 2008 (the upper limit for this analysis' time series being 2007). The information used from these datasets concern the number of incoming refugees to a host country, and these datasets are by far the most complete on the issue. All refugee data are log transformed in order to reduce the impact of extreme values.

3.4.2.2. Renewable Resource Scarcity

Renewable resources are natural resources that *theoretically* regenerate themselves indefinitely, through normal ecological processes. Scarcity of such resources emerge when the flow or stock of the resource is quantitatively exhaust or qualitatively degraded at a rate faster than its regeneration, or distributed so as to artificially deprive individuals of the resource (Kahl 2006: 31). Population growth, be that on a national or international scale, has often been the focal point of models of environmental degradation. Growing populations have been considered one of the factors that greatly exacerbate poverty, starvation, economic stagnation and resource depletion (Tir & Diehl 2001: 58). Homer-Dixon emphasises that what should be investigated are not

absolute sizes but rather resource supply *relative* to the demand and social distribution of that resource (Schwartz, Deligiannis & Homer-Dixon 2001: 275).

Common forms of environmental degradation include land degradation, desertification, rising sea levels induced by global warming and deforestation with its many consequences (Suhrke 1993: 3). This thesis primarily focuses on arable land and its availability.¹⁴ Theoretically this focus is a natural limitation. Homer-Dixon, as a chief provider of premise concerning resource scarcity and conflict, defines renewable resources as being cropland, water, forest and fisheries (Homer-Dixon & Blitt 1998). The most important of these resources are cropland and freshwater (Homer-Dixon 1999; Kahl 2006). Homer-Dixon believes that environmental scarcity has “it’s most profound effects on people’ lives in rural areas” (Homer-Dixon 1999: 166). He claims that land stress and bulging populations may generate waves of refugees that spill across borders, having destabilizing effects on the recipient’s domestic order and on international stability (Homer-Dixon 1991: 77). Myers (1992) argues that population growth in conjunction with environmental degradation that to a great extent stems from this very population growth, overwhelms the environmental underpinnings of agriculture. A state’s functional capacity heavily relies on the agricultural sector’s self-sufficiency in times of demographic and environmental stress (Kahl 2006: 47). It may also be argued that this resource indirectly takes into account a certain freshwater availability, since this a predicament of agriculture. Brown follows this reasoning by arguing that agricultural commodities may very well function as proxy for key natural resources, like water and land, and can increase the risk of competition, and perhaps conflict, over scarce resources (2008: 1).

¹⁴ There are several alternative measures. Other frequently mentioned resources are fisheries and forests. Arable land, however, seems to be most fitting in this context. First and foremost, the focus on arable land can be legitimized theoretically. Secondly there are significant data challenges both concerning availability and the diverting understandings of the mere measures of the mentioned alternative resources.

To illustrate this logic statistically, the ‘Potential Cropland’ (per capita cropland scarcity) variable will be an important operationalization of the renewable resource scarcity concept. The operationalization demonstrates renewable resource scarcity by creating a variable of productive soil relative to population size, further indicating population pressure on these resources. The variable is defined as “all of a country’s land that falls into the following land use categories: arable land, permanent crops, permanent pastures, and forests and woodland” (Urdal 2005: 424). This variable is log transformed given that there is reason to believe that there is no linear relationship between density and conflict¹⁵ (Tir & Diehl 2001). This transformation also excludes extreme cases possibly disturbing the results¹⁶. This measure originates from Urdal’s study of 2005, and therefore needed a seven year update considering the scope of *this* analysis. The ‘Potential Cropland’ variable represents the population pressure on the amount of land available for agriculture. Assuming insignificant changes in arable land during recent years, this variable was updated by calculating the annually updated population of each country relative to their respective year 2000 value on arable land¹⁷. The source data for these calculations are developed by the UN Population Division (Demographic Yearbook, annual), the World Development Indicators (World Bank), World Factbook (CIA annual), Encyclopaedia Britannica (Britannica annual) and The Statistical Abstract of the World (Reddy, 1994) for small states.

The independent variable mapping the share of rural versus urban population within a given country is meant to give an idea of the domestic context. There is little and incomplete data on agricultural populations, resulting in this alternative measure. The assumption is that the rural population primarily relies on agriculture, while the urban

¹⁵ When a country reaches a certain level of density, it is probable to expect a decrease in effect. It is a larger transition for a smaller country to have a population density go from 200 to 1200, than it is for a larger country to go from 5000 to 6000

¹⁶ Extreme-value countries such as e.g. Singapore and Bahrain.

¹⁷ This is also the assumption in the original study, where the potential cropland is based on a single observation per country only dating from the 1993-2001 period (Urdal 2005: 424).

population does not. This is a more inaccurate, but arguably reasonable, proxy. The information used directly in the analysis is the percentage of rural population. These data stem from the UN Population Division (UN 2008), and spans throughout the time-series of the analysis (1950-2007) with data updates for each country every fifth year.

3.4.2.3. International Aid

International aid includes net official development assistance and official aid (measured in current US \$). A limitation of this variable is that it lacks a geographic component, which can mean that in practice, the aid resources can be used in different parts of the country other than those areas hosting refugees. Nonetheless, there are other consequences of receiving aid that may be considered to ameliorate a refugee situation, and thereby reduce the potential conflict level. There is a direct effect given that aid presupposes a system of distribution that in turn can enable a more efficient handling of refugees, compared to countries where this is non-present. Foreign aid can also serve as an indicator of the degree to which donor-countries would be interested, or likely, to get involved in a crisis- or refugee situation. By this logic, high levels of foreign aid should indicate a willingness of third parties to contribute, if the situation so requires. To best measure this presence, data on the amount of aid per capita will be used. These data are collected and developed by the World Development Indicators (World Bank, 2008).

3.4.3. Control Variables

There are two different development indicators in the analysis. The Infant Mortality Rate (IMR) is expected to better fulfil its intention, but the traditional measure using

Gross Domestic Product (GDP) per capita (Gleditsch 2002)¹⁸ will serve as a control, as well as comparison. Using country-year as the unit of analysis, and the *onset* of conflict as the dependent variable, problems of autocorrelation may occur. A country having experienced conflict in a given year is inherently likely to be in conflict the following year also (Hauge & Ellingsen 2001: 47; Hegre et al. 2001). In order to reduce the potential impact of this problem, the ‘brevity of peace’ variable is used to control for conflict in the previous year/ years since last conflict (Hegre et al. 2001). This variable controls for time dependency in the study of conflict, and assumes a positive relationship between past conflict and the risk of new conflict onset. The rationale predicts the temporal dependence to be strongest directly after a conflict, and thereon decrease with time. It may be expected that the correlation between population pressure and conflict will decrease after reaching some threshold. “States can handle only so much conflict and at some limiting point additional population pressure will not produce any greater likelihood of conflict involvement or escalation (Tir & Diehl 2001: 69).” By this logic the total population data is log transformed.

Regime is theoretically argued to integrate the variables of *opportunity structure* and *state capacity* (Schwartz, Deligiannis & Homer-Dixon 2001: 279). The Polity IV scheme examines “concomitant qualities of democratic and autocratic authority in governing institutions”. The “Polity Score” illustrates this regime authority spectrum on a 21-point scale ranging from -10 (hereditary monarchy) to +10 (consolidated democracy) (Marshall & Jaggers 2002)¹⁹. The effect of democracy on conflict is debated, and the very term ‘democracy’ is claimed to be used too loosely by lay commentators and experts alike. A comprehensive understanding of the term includes an extraordinarily complex “set of social phenomena and institutions that have complicated and multiple effects on the incidence of social turmoil and violence (Homer-Dixon 1999: 182)”. Theories concerned with democracy and conflict tend to

¹⁸ These are updated until 2004, while the data on IMR stretches throughout the period of analysis (1950-2007).

¹⁹ The Polity variable is imputed for all years that miss or that uses transition codes. The ‘polmiss’ variable is intended to discover the possible distortion that this may provoke. This dummy variable is included to avoid losing too many observations.

indicate that democracies experience less conflict and rebellion, relative to autocracies and in-between regime types. However, note that the democratization process itself might generate conflict (Hauge & Ellingsen 2001: 42). Others claim that it is democracies in transition, meaning regimes in a process of change, are most inclined to experience conflict. This suggests that the democratization process in itself may generate conflict (Hegre et al. 2001). If the state failure hypothesis is an important pathway to armed conflict, it should be expected that statistical controls for low state capacity and state failure should capture some of the explanatory power of the demographic and environmental variables. Previous studies have shown curvilinear coherence regarding the Polity variable, so the quadratic value of this variable is introduced in order to capture this effect. The control variable Polity squared checks for curvilinearity. The variable thereby assumes that the middle-values are those most prone to affect the dependent variable. This is theoretically defended by the assumption that the societies in polity transition are more likely to experience conflict, in contrast to the extreme values on this scale, that are either perfectly authoritarian or democratic (Hegre et al. 2001).

3.4.4. Validity and Reliability

Determining the quality of the analysis is influenced by validity and reliability assessments. Reliability is concerned with the degree to which data is measured without error, and implies a notion of replicability (Theisen 2006: 62). This entails the precision of measuring data. The validity depends on *what* is measured, and whether these entail the qualities and characteristics of the relevant research question. It indicates the quality of the empirical operationalizations of a theoretic definition (Hellevik 2002: 52-53, 471). The validity also suggests whether the indicators used actually fit the causal arguments of the theory. The reliability of the data is critical for the validity of an analysis. High reliability is a necessary, but not sufficient, condition

for high validity (Theisen 2006: 62). To ensure a defensible level of validity, necessary assumptions of logistic regression must be satisfied. The different data used for the analysis in this thesis have, almost all of them already been used in published studies (Urdal 2005, Salehyan & Gleditsch 2006), and stem from recognized sources of data collection (World Bank, United Nation Population Division etc). The reliability of the data is expected to be quite high. There are many observations, and no alarming amounts of missing²⁰. Given that one of the main explanatory variables (refugees) has two different sources of data, the reliability should increase further, ensuring more accurate measures (this also applies to the development indicator IMR and GDP).

The operationalizations of ‘migration pressure’ and ‘renewable resource scarcity’ are perhaps the variables that deserve the most scrutiny in regard to validity. The requirement of quantifiable values was a main concern when operationalizing migration pressure. Most migrate within their state’s borders, and are so called internal migrant or internal refugees. Accurate numbers of these are however difficult to find, although there is an increase of interest concerning such migration patterns. Additionally there is no consensus on their very definition, making it difficult for empirical studies to determine who falls under this category. There are reasons to believe that internal migration poses less additional strains on resources relative to external migrant or refugees, indicating that cross-border migration is more relevant to the dependent variable (violent conflict).

Renewable resource scarcity has not such an obvious solution as had the migration variable. When it comes to renewable resource scarcity, there are challenges both due to data and the conceptualization. Inspired by Urdal’s solution to this problem, potential arable land, having already been theoretically identified as a main resource, together with population forms the ‘potential cropland’ variable (2005). This

²⁰ Only the ‘aid’ variable has substantial amount of missing, which is taken into account throughout the Thesis.

operationalization includes a population pressure aspect by considering scarcity relative to the population in the respective states, further increasing its relevance to the theoretic material of the thesis. The controls used, are all ‘standard’ in quantitative studies on civil war.

4.0. Time-Series Analysis²¹

The three previously presented hypotheses of this thesis expect that migration pressure (operationalized as refugees) and constraint on renewable resources (per capita availability of arable land) are problematic, and thereby increase the probability of conflict (both conventional and non-state). Aid (per capita) is further assumed to mediate the effects of migration. These assumptions are statistically explored through logistic regression analysis. The countries used in this analysis are restricted to those that enjoy independence, and meet the minimum requirement of 250 000 inhabitants (in year 2000)²². Migration pressure, operationalized as refugees, is the independent variable with the most emphasis. Two different sources of refugee data are used to ensure the most correct results as possible. The analysis, as a whole, spans over the years 1950 to 2007. The refugee data gathered by Salehyan and Gleditsch (2007) cover the years 1950-2001, and the data provided by the Center for Systemic Peace, last from 1964 to 2007. These data are analysed separately, and combined constitute the data material on refugees allowing full coverage of the time-period of the analysis. In all models, the main explanatory variable, indicating migration pressure, is examined alone together with the control variables. In order to more closely examine the data and either confirm or deny the presented hypothesis, the models will subsequently be expanded by the inclusion of the other variables and interaction terms as well as the controls.

The Malthusian perspective is integrated in the analysis by the very variables under scrutiny. Although the theory is complex, the investigation of the above-mentioned variables is a reasonable simplification of main concepts. Likewise, it is difficult to

²¹ All models have been run using both IMR and GDP separately, as development indicators. Although it does not explain the amount of variance, the Pseudo R² indicates that IMR is slightly better suited for the majority of the models. The IMR measure will therefore be used when presenting the different models.

²² The country list is, throughout the analysis, based on an updated version of the dataset of Urdal 2005.

capture all aspects of Homer-Dixon's understanding of environmental scarcity. 'Demand-induced' scarcity is measured by population growth, and further operationalized as incoming refugees. 'Supply-induced' scarcity is measured as land degradation, and operationalized as per capita availability of actual and potential cultivable land. The politics of distribution entailed in the notion of 'structural scarcity' is an effect not easily captured, at least not in *this* analysis, nor is it a priority of the thesis. Kahl sums up the reasoning of Goldstone and Homer-Dixon, which clarifies the expectations of the following analysis *and* the emphasis put on different aspect of the theory (population and environmental pressure, agriculture, aid and state capacity), resulting in the before-mentioned variables.

[...] population and environmental pressures in developing countries often generate intense hardship among agricultural labourers and the urban poor. They contend, however, that strong capable states are typically able to prevent such deprivation coalescing into organized violence through a mix of relief for aggrieved individuals, co-optation of opposition leaders, and outright coercion. Therefore, large-scale violence is only likely to occur when social grievances emanating from rapid population growth, environmental degradation, and natural resource scarcity combine with eroding state authority and escalating intra-elite competition (Kahl 2006: 10).

My analysis is not limited to the developing world, and has undergone necessary simplifications in order to conduct analysis.

4.1. Conventional Conflict

When only considering the effects of migration pressure (refugees) in the models of conventional conflict (using both sources of refugee data), these are highly significant and thereby in accordance to the findings of Salehyan and Gleditsch (2006). This is reassuring, and provides an excellent basis for the remaining analysis. These authors understand the effects to imply a spreading of conflict by refugees, entailing the import of ideology arms etc. If the theoretical assumptions presented in *this* particular thesis are correct however, these effects should at least be partly dependent on high renewable resource scarcity and absence of international aid (and to a certain extent in a context of large rural populations).

Table 1: Conventional Conflict Logistic Regression Results, 1964-2007 (Odds Ratio)

Explanatory Variables	Model 1.0.a	Model 1.0.b	Model 1,1	Model 1,2	Model 1,3
Refugees_CSP	1.051***	1.048***	1.056***	1.046***	1.048***
Potential Cropland		0,968	0,971	0,947	0,968
Aid per capita		0,998	0,998	0,998	0,998
Rural Population		1,007	1,006	1,007	1,007
Interaction Terms					
Refugees & Rural Population			0,999		
Refugees & Potential Cropland				0,989	
Refugee & Aid					1,000
Control Variables					
Infant mortality rate	1.010***	1.007***	1.007***	1.008***	1.007***
Total Population	1.261***	1.358***	1.256***	1.367***	1.258***
Regime	1,008	1,005	1,005	1,005	1,005
Regime, squared	0.985***	0.986***	0.986***	0.986***	0.986***
Missing regime data	1,649	1,040	0,92	1,147	1,050
Controls for statistical dependency					
Brevity of peace	2.746***	3.005***	2.981***	2.971***	3.000***
N	4927	4586	4586	4586	4586
Log likelihood	-613,021	-576,380	-575,961	-575,913	-576,369
Pseudo R2	0,096	0,095	0,095	0,095	0,095

NOTES:

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Italics = part of interaction term.

The migration pressure indicators remain significant at a level of one percent, even with the inclusion of the other variables, and in respect to both sources of migration data. There are minimal changes in the Odds Ratio. None of the newly added variables reach significance, and both migration pressure and most of the control variables are consistently significant through all models. Neither significance nor effects seem to be altered to any large extent.

Table 2: Conventional Conflict Logistic Regression Results, 1950-2001 (Odds Ratio)

Explanatory Variables	Model 2.0.a	Model 2.0.b	Model 2.1	Model 2.2	Model 2.3
Refugees_S&G	1.052***	1.044***	1.055***	1.043**	1.045**
Potential Cropland (log)		0,981	0,983	0,984	0,981
Aid per capita		1,000	1,000	1,000	1,000
Rural Population		0,999	1,002	0,999	0,999
Interaction Terms					
Refugees & Rural Population			0.999*		
Refugees & Potential Cropland				0,997	
Refugee & Aid					1,000
Control Variables					
Infant mortality rate	1.006***	1.007***	1.007***	1.007***	1.007***
Total Population (log)	1.214***	1.278***	1.281***	1.281***	1.279***
Regime	1,004	1,004	1,002	1,004	1,003
Regime, squared	0.985***	0.985***	0.986***	0.985***	0.986***
Missing regime data	0.102**	0,278	0,297	0,279	0,284
Controls for statistical dependency					
Brevity of peace	3.465***	3.299***	3.250***	3.311***	3.300***
N	5921	4606	4606	4606	4606
Log likelihood	-718,947	-596,700	-595,282	-596,667	-596,667
Pseudo R2	0,088	0,088	0,090	0,088	0,088

NOTES:

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Italics = part of interaction term.

Including interaction into these models has little implication²³. When using the more recent CSP data the variables stay very much unchanged, with none of the interactions being even remotely significant. The migration pressure indicator remains significant at a one percent level throughout, and the control variables also keep their significance, as well as their effects. The Salehyan and Gleditsch data, being slightly more dated, again shows mainly the same results. The refugee variable stays significant throughout all models, as do the control variables. There are small changes in Odds Ratio and no interactions are highly significant. However, the interaction term of refugees and rural population is significant at ten percent, with negative effect. This could imply that the impact of added migration pressure on conflict potential is higher in countries with lower rural population, which in turn can be interpreted as countries with higher population density. This reasoning fits with the neo-Malthusian logic of population pressure's impact on conflict. A fixed population pressure is expected to be perceived relatively more intense in areas already experiencing a higher population density. This negative effect, however, seems to be weak. Considering the Pseudo R2, there is very slight reduction in the models when adding more variables no matter the migration data used. Although difficult to interpret substantially, comparing the Pseudo R2 values of the different models may be useful as the increase in value indicates a decrease in log likelihood, implying an improved model²⁴.

²³ Although no main focus of this thesis, both conventional conflict and non-state conflict tested for the possible interaction between renewable resource scarcity and rural population. This could indicate whether resource scarcity is of greater or less importance to the risk of conflict in a country, relative to its size of rural populations. None of these interaction terms, however, proved significant.

²⁴ Also, however difficult to interpret, given the amount of observations in the analysis the Prob>chi2 at least implies that the models cannot be rejected.

As has been shown in regards to conventional conflict; migration pressure is significant, unlike any of the other independent variables. The significance of the migration pressure impact on conventional conflict onset, *could* lend support to the perspective of conflict ‘contagion’ effects, which previously has found empirical support (Salehyan & Gleditsch 2006, Forsberg 2009). The contagion hypothesis associates refugee flows with destabilising spill-over effects, which indicates that host countries receiving refugees from countries in civil war, are more prone to conflict than states not receiving such refugees (Forsberg 2009b: 20). These studies connect refugees and conflict onset empirically, such as is done in *this* thesis, but to thereby interpret this as support for this theory, will be a little too hasty. The results of Salehyan and Gleditsch in their study of “Refugees and the Spread of Civil War” (2006), find empirical evidence suggesting that refugee flows represent a driving force in the diffusion of civil conflict, and that this in turn creates security concerns for host countries. They emphasise, however, that this constitutes no deterministic links between refugees and conflict, and that the majority of cases of refugee flows do not result in violence (ibid: 360-361).

Comparing coefficients between our studies, mine have stronger effects on conflict onset (0.042 versus 0.051)²⁵ when using the same refugee data and only control variables²⁶. When including all other contextual variables this difference in effect is lost (0.042 versus 0.043)²⁷ (Salehyan & Gleditsch 2006: 355). Salehyan and Gleditsch investigate the likelihood of refugees from neighbouring countries influencing the risk of conventional conflict onset. The refugees accounted for are thereby those that migrate from areas close by. One should think, given the reasoning of their study, that looking at this group isolated would result in a clearer impact on conflict. The refugees

²⁵ ²⁷ See Appendix 7.3.

²⁶ Given the approximate number of observations, and using the same refugee and conflict data, despite being difficult to interpret, the coefficients may be compared to certain, though limited, extent.

are assumed to have more interest in mobilizing in favour of a warring party when it is considered that this may have plausible effects in their country of origin (See also Wiener & Teitelbaum 2001; Lee 2001). This, however, does not seem to be the case as my investigation of refugees irrespective of ‘area-attachment’ have similar effects on conflict onset, if not even stronger effects. It would be presumptuous to suggest denial of the “contagion effect”, but it would, perhaps, encourage further scrutiny²⁸.

4.2. Non-State Conflict

It is worth remembering that the non-state data have a considerably shorter time-series compared to the other dependent variable, conventional conflict onset (2002-2007 versus 1950-2007). When investigating non-state conflict, only the CSP refugee data are used, given its time-series. The migration pressure variable, which is strongly significant when it comes to conventional conflict, is insignificant concerning non-state conflict²⁹. The migration effect on non-state conflict using only control variables is also insignificant. This diverts from the (expected) outcomes of the conventional conflict models and theoretical assumptions, such as those derived from Malthus especially. Significance may perhaps not be reached because these data include a far shorter time series and, but this is difficult to determine. The potential cropland variable, however, indicating the population pressure on arable land, and thereby

²⁸ They present in their study significant findings with stronger coefficients, but these use the traditional civil war measure of 1000 battle deaths, and are therefore unsuited for comparison. The authors also argue that this threshold is a problematic one.

²⁹ When using the cross-sectional design on the non-state conflict data, the refugee variable turns significant at a five percent level with clearly positive effects, when only including control variables. This is in accordance to the theoretical expectations of this thesis. This could suggest that the previous insignificant findings concerning non-state conflict and migration pressure *could* be a result of an insufficient time-series, rather than uncorrelated theory and empirical findings.

resource scarcity, is significant almost at the one percent level³⁰. Counter-intuitively, this variable appears to have *negative* effect on non-state conflict, entailing a reduced risk of non-state conflict, given higher values of renewable resource scarcity³¹. These models cannot be rejected, given the Pseudo R2 in the test of goodness-of-fit that indicates an improvement in model fit when adding contextual variables³².

Table 3: Non-State Conflict Logistic Regression Results, 2002-2007 (Odds Ratio)

Explanatory Variables	Model 3.0.a	Model 3.0.b	Model 3.1	Model 3.2	Model 3.3
Refugees_CSP	0,962	0,969	0,947	0,973	0,990
Potential Cropland (log)		0.660**	0.652**	0.672**	0.657**
Aid per capita		0,990	0,989	0,990	0.984*
Rural Population		1.023*	1.024*	1.023*	1.027**
Interaction Terms					
Refugees & Rural Population			1,003		
Refugees & Potential Cropland				0,984	
Refugee & Aid					0.996*
Control Variables					
Infant mortality rate	1.026***	1.019***	1.020***	1.020***	1.018***
Total Population (log)	2.255***	2.536***	2.540***	2.554***	2.520***
Regime	1,023	1.069*	1.064*	1.068*	1.079*
Regime, squared	0.985*	0.976***	0.976***	0.976***	0.974***
Missing regime data	0,302	-	-	-	-
Controls for statistical dependency					
Brevity of peace	4,920	4,178	3.767***	4.098***	3.499***
N	925	845	845	845	845
Log likelihood	-143,012	-122,485	-121,633	-122,380	-120,672
Pseudo R2	0,340	0,373	0,377	0,374	0,382

³⁰ When applying GDP per capita as development indicator, the Potential Cropland variable remains significant, at a five percent level.

³¹ Due to amounts of missing, the independent variable ‘aid’ was attempted excluded from the model. Following this the potential cropland variable loses its significance. When testing for interaction between the two variables, this is nonexistent. The exclusion of the aid resulted in an increase from 845 observations to 919.

³² The considerably higher values of Pseudo R2 compared to conventional conflict is not uncommon given both the time-series of the data and measure of onset versus incidence of conflict.

NOTES:

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Italics = part of interaction term.

The interaction between the refugee variable and rural population is insignificant, both the control variables and the potential cropland variable remain significant. Although resulting in minimal changes in its effect on the dependent, the resource scarcity indicator even improves its level of significance slightly. This variable also interacts insignificantly with refugees. The interaction between refugees and aid is almost significant (0.07), but results in little change otherwise in the model. None of the interactions are significant, but it is interesting to note that the potential cropland variable remains significant through all tests. The percentage of rural population is either significant, or close to significant, in all models. These two variables do not significantly interact. The aid variable stays insignificant through all tests. The control variable indicating the brevity of peace continues to be significant with relatively strong effects.

The theoretical implications of the findings of *this* analysis seem to question the presumptions of both Malthus and the relative deprivation aspects of renewable resource scarcity literature. Neither migration nor resource scarcity have shown expected effects. First of all, migration has no significant impact on conflict. Although the added population pressure that refugees represent have seemingly no importance concerning this type of conflict, the total population variable remains significant at one percent through all models, with positive effect³³. This last variable could, however, indicate the size of a country, rather than its population density, and is thereby no accurate indicator. Secondly, resource scarcity indicates a reduction in the risk of conflict. As the Potential Cropland variable is negatively significant, one should

³³ This variable is also significant in relation to conventional conflict, although the Odds Ratio effects in these cases are positive but weak.

expect that the rural population indicator is complementary, and thereby has the same direction of results. This latter variable, however, has sporadically significant but *positive* effects on non-state conflict, entailing that high values on this variable indicates heightened risk of conflict.

From these results one can argue that *if* the total population indicator indeed measures population density to a reasonable extent, then the considerably stronger effects this variable has on non-state conflict compared to conventional conflict, may assume that in densely populated areas, the likelihood of a strong central power is low and thereby suggesting low government involvement. The strong negative effect of renewable resource scarcity further implies that there in such areas, naturally, is no scarcity of land, both arable (as indicated in the Potential Cropland variable) and otherwise.

4.3. Analysis Summary³⁴

The time-series logistic analysis of conventional conflict stays relatively unchanged, despite the inclusion of additional contextual factors, as well as when testing for interaction. The results indicate a clear significance of additional migration pressure (refugees) at a constant one percent level, with the approximate positive Odds Ratio effect of 1.04. These effects persist seemingly unaffected by additional variables and interaction terms. The control variables also remain significant. Diversions in the

³⁴ Tests using cross-sectional analysis have been done in an attempt to give a closer look at the possible relationship between the hypothesized variables. For the Salehyan and Gleditsch refugee data this is year 2001, and for the CSP data (in relation to both conventional and non-state conflict) this is year 2007. The aid variable is unfortunately excluded, as the large amounts of missing distort the results. Non-state conflict has no significant variables or interaction. The migration variable is significant at a 5% level with clearly positive effect, but loses its significance at the inclusion of other contextual variables. When investigating conventional conflict, none of the independent variables are significant, except resource scarcity, which indicates significance at a 10% level (0.089) with strong negative effects on the dependant (using CSP data). There is no interaction.

statistical findings given the use of refugee data may either be due to the accuracy of observation or the somewhat different time-series, although it is difficult to distinguish these effects.

Non-state conflict loses the significance of migration pressure, but indicates strong significance regarding renewable resource scarcity at an almost one percent level. The effects on conflict, however, are quite strongly negative. This variable remains significant throughout all the models. It is argued frequently that the larger the role of scarcities, the smaller the conflict (Homer-Dixon 1999; Suliman 1999a, b; Theisen & Brandsegg 2007). This is also the underlying assumption of the second hypothesis of this thesis, but the results of the analysis contradict these expectations, given the significance and *negative* effects of renewable resource scarcity in relation to non-state conflict³⁵. Rural population stays interchangeably significant, or close to significant, with positive effect. Though there are no significant interactions, the aid and refugee variables almost reach a significant level (0.07), having weak negative effects.

³⁵ Although the bar for qualifying as conflict is equally low in both types of conflict, non-state conflict is, as previously mentioned, does not suppose governmental involvement and thereby is assumed to more easily qualify as conflict.

5.0. Conclusion

This analysis lends little support to the ‘renewable resource scarcity’ perspective. The logistic time-series analysis offers support to the effects of migration pressure on the outbreak of conventional conflict, but does not find the same connection when studying non-state conflict. Here; renewable resource scarcity is found to have significant negative effects, while this relationship is reversed when it comes to conventional conflict. Non-state conflict seems to give less support to the neo-Malthusian perspective, given that the crucial argument of population pressure fails to be a significant factor when measured as an added pressure by refugees.

The first hypothesis assumes that “Migration pressure is particularly likely to increase the risk of conflict in the context of increasing renewable resource scarcity”. The results of the analysis indicate that added population pressure, as operationalized in this thesis, has significant effects on the outbreak of conflict when investigating conventional conflict. This variable has no effect on non-state conflict, while the resource scarcity indicator, however, is significant. The rejection of the first hypothesis is two-fold. First of all, whenever one of these effects is present, with emphasis on migration pressure or renewable resource scarcity, all other effects disappear, often with the exception of the control variables. This means that the independent variables fail to constitute a situation where these both have significant effects on the dependent variable. Although being individually important, these effects do not appear coincidentally and thereby invalidating the hypothesis. Secondly, despite indicating the significance of renewable resource scarcity, the results indicate a complete reverse of the hypothesis’ assumption, as renewable resource scarcity in fact *reduces* the risk of conflict.

The second hypothesis describes the types of conflict that are anticipated given its causes of renewable resource scarcity and migration pressure: “Violent conflict

resulting from the interaction between migration pressure and renewable resource scarcity, is of a low-intensity nature, and does not presuppose government involvement". The expectations that this second hypothesis puts forth, explains the use of the PRIO and Uppsala conflict data and its low requirement of conflict intensity³⁶. To fully interpret a denial or confirmation of this second hypothesis is a challenge, as results from the analysis are mixed, and there are not found significant findings in both explanatory variables (Potential Cropland and Refugees) to be able to construct the hypothesised context. An indication of conflict intensity, is the assumption that non-state conflict, by not demanding government involvement, represents even smaller conflicts. Following this reasoning, resource scarcity should have positive effects on this type of conflict, but this is not the case. Renewable resource scarcity has negative effects implying that such context in fact reduces the chances of non-state conflict. This betrays the theoretical notion that the greater resource scarcity, the smaller the conflict. Migration has a significant and positive effect on state-based conflict. Although this is in line with the overall theory of this thesis, it may reject this particular hypothesis. One would expect a higher risk of conflict due to migration pressure regarding non-state conflict, but this is not the case. It is safe to say that this hypothesis can be rejected. Not only are there no signs of increased risk of non-state conflict, regarding migration pressure, renewable resource scarcity has either none or negative effects on this type of conflict.

The third hypothesis predicts that aid has a mediating effect on conflict in the context of renewable resource scarcity and migration pressure. The supposed reduction in risk of conflict by aid does not find empirical support. Throughout the different types of analyses and tests run, the aid variable fails to reach significance. Neither in context, as supposed by the hypothesis, nor alone does this variable have significant effects. What this extends to indicate is not easily determined. Empirically the hypothesis is obviously rejected. However, that this variable remains insignificant may well be due

³⁶ A reduced limit to 25 battle-related deaths from the traditional measure of 1000.

to the amounts of missing. If this is the case, a positive effect should be expected (as the variable in the analysis is inversed), but it is impossible to predict the direction of effects, precisely because of its insignificance.

In sum, none of the hypotheses, derived from the neo-Malthusian renewable resource scarcity literature, are empirically supported by the analysis conducted in this thesis. Methodologically, not only do the different model designs offer different results, but the analysis is naturally restricted by the data that is used. The time-series analysis seems to demonstrate effects indicating that the two different kinds of conflict analysed here are influenced by different factors. The onset of conventional conflict seems to rely positively on the additional population pressure presented by incoming refugees. The incidence of non-state conflict on the other hand is rather strongly influenced by renewable resource scarcity. Remarkably, this entails an effect quite opposite of what was expected, which reduces chances of conflict by increase in resource scarcity. The hypotheses suppose interaction mechanisms that are not present in any of the models, as the variables indicating renewable resource scarcity and migration pressure never appear significant simultaneously. The lack of clear and unambiguous findings does not necessarily contradict Homer-Dixon, as he expected the importance of environmental factors on conflict to increase with time.

[...] As yet, environmental scarcity is not a major factor behind most of these conflicts, but we can expect it to become a more important influence in coming decades because of larger populations and higher per capita resource consumption rates (Homer-Dixon 1999: 13).

This could offer a theoretical explanation for the mixed findings of this analysis, yet inspire future studies, as the effects of the renewable resource scarcity predicaments are anticipated to further develop with time and become increasingly important. My

findings, however, seem to contradict this statement, as for now, suggesting that renewable resource scarcity has no impact on conventional conflict, and is associated with reducing risk of non-state conflict. Further, added population pressure is relevant only to the outbreak of conventional conflict, while having no effects on non-state conflict.

The findings of this particular study can arguably have been shaped by both technical and theoretical factors. The concepts of the resource scarcity and the neo-Malthusian literature are complex, and thereby perhaps not easily captured in a limited quantitative study such as this. Contingent arguments and intricate causal chains leave much to be approximated. This analysis offers a different way of operationalizing population pressure from the mere conventional measures of the neo-Malthusian assumption of population growth. The population pressure impact of refugees can be understood as of more acute importance to an area, relative to natural population growth. This allows a rather detailed measure of the pressure impact in time, which is important considering the accurate dating of conflict. Renewable resource scarcity is in the analysis understood as the relative availability of arable land, obviously excluding other relevant forms of renewable resources. These are, nevertheless, all necessary limitations. For better information about the de facto relationships between migration pressure, resource scarcity, and conflict, a quantitative disaggregated local-level study is advised. These variables fail to be more area-specific than what is defined by country borders. This limits the possibility of connecting population pressure and local renewable resource scarcity to conflicts in smaller concrete areas and thereby being able to more reasonably assume that these factors are closely associated. However, data allowing this is limited, and the manner in which it is undertaken here should be considered to be a qualified first attempt.

I justified my study by the use of new data, and the alternative causal connections I investigate by including migration, scarcity and both conventional and non-state

internal conflict in my analysis. The interaction of migration and resource scarcity in potentially causing conflict, have so far not been thoroughly investigated, which leaves room for the contribution of this Master's Thesis. As mentioned, few large-N studies have found strong empirical support for the relationship between resource scarcity and internal conflict. The results of this thesis have been able to confirm such a relationship, although what is remarkable is that the effect is negative, and rather strongly so. It is safe to say that this represents quite the opposite direction of what was anticipated. That renewable resource scarcity in fact reduces the risk of conflict not only rejects a hypothesis, but contradicts the theoretic assumption this was built on. Despite the Homer-Dixon 'clause' of a scarcity-violence phenomena in development, and being increasingly significant, one should not expect such strong empirical effects suggesting the opposite, but rather expect to find what he himself has found in his much debated case studies (1999). Migration pressure results offer some support to the neo-Malthusian perspective, at least concerning conventional conflict, which traditionally has been the type of conflict under investigation.

Despite an almost unambiguous rejection of all hypotheses, and being aware of the limitations of the analysis, this thesis may lend some discredit to the most grim predictions of resource scarcity's deterministic violent consequence. Migration, however, continues to play part in the onset of conventional conflict. These findings indicate that although environmental degradation, resulting in renewable resource scarcity, in it self may be no threat, then migration may be. This could support the 'contagion' effect in reference to refugees in particular, as discussed, or have indications of a situation more directly related to environmental issues. Despite not being concerned with the reasons for flight in this study, and with emphasis on the great difficulties of being able to map and estimate environmental refugees, these refugees may, after all, be indirectly relevant to the results of this study. As environmental degradation, and thereby renewable resource scarcity, causes migration and not conflict, this could nevertheless ultimately result in internal armed conflict in the host area, given that migration by itself is found to be a catalyst for conflict.

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7.0. Appendix

7.1. Descriptive Statistics over the Dependent Variables

Variables	Obs	Mean	Std. Dev.	Min	Max
onset	7095	0.028189	0.165524	0	1
NonStCon	1013	0.057256	0.232445	0	1

7.2. Variable Correlation Matrix³⁷

	ConvC	Ref	AidP	PotC	RurPo	TotPo	BrevP	IMR	Reg	RegSq	RegM
ConvC	1										
Ref	0.0522	1									
AidP	-0.01	-0.008	1								
PotC	-0.011	-0.074	0.0197	1							
RurPo	0.0683	-0.044	0.0387	-0.201	1						
TotPo	0.0415	0.3704	-0.36	0.1263	-0.045	1					
BrevP	-0.016	0.1146	0.0265	0.0378	0.2011	0.2598	1				
IMR	0.0796	-0.066	0.0438	-0.296	0.724	-0.122	0.2024	1			
Reg	-0.036	0.0396	-0.06	0.069	-0.36	0.1436	-0.073	-0.533	1		
RegSq	-0.085	-0.077	-0.116	0.0319	-0.369	-0.005	-0.27	-0.401	0.3123	1	
RegM	-0.003	0.0205	0.1038	0.0529	-0.001	-0.028	0.0845	0.0016	-0.008	-0.165	1

Conventional Conflict, 1964-2007 (CSP data)

³⁷ Multicollinearity is difficult to reject. A rule of thumb is that correlations between two variables of 0.8 or higher could indicate a problem of multicollinearity. A sign of this problem is that model results are very unstable, depending on the inclusion or exclusion of the highly correlated variables. The correlation matrix in this analysis, however, indicates no significant correlation. The variables that are most highly correlated are the development indicators; IMR and GDP, but these are never analysed simultaneously.

	ConvC	Ref	AidP	PotC	RurPo	TotPo	BrevP	IMR	Reg	RegSq	RegM
ConvC	1										
Ref	0.0599	1									
AidP	-0.015	0.0137	1								
PotC	-0.013	-0.003	0.0569	1							
RurPo	0.055	0.1448	-0.006	-0.238	1						
TotPo	0.0502	0.2817	-0.369	0.0863	0.004	1					
BrevP	-0.015	0.1837	0.0152	0.0386	0.1715	0.2731	1				
IMR	0.0668	0.0539	-0.026	-0.306	0.7396	-0.052	0.1674	1			
Reg	-0.034	-0.101	-0.052	0.0746	-0.354	0.122	-0.056	-0.533	1		
RegSq	-0.073	-0.134	-0.109	0.0149	-0.289	0.0777	-0.218	-0.314	0.2616	1	
RegM	-0.026	-0.099	0.2214	0.0926	-0.124	-0.288	-0.019	-0.106	0.0013	-0.319	1

Conventional Conflict, 195-2001 (Salehyan & Gleditsch data)

	ConvC	Ref	AidP	PotC	RurPo	TotPo	BrevP	IMR	Reg	RegSq	RegM
ConvC	1										
Ref	0.1263	1									
AidP	-0.053	-0.075	1								
PotC	-0.019	-0.011	-0.134	1							
RurPo	0.2028	-0.004	0.2153	-0.03	1						
TotPo	0.236	0.3907	-0.409	0.154	0.0045	1					
BrevP	0.309	0.1931	-0.028	0.0617	0.2934	0.3175	1				
IMR	0.2569	0.1883	0.2306	-0.198	0.626	-0.054	0.2976	1			
Reg	-0.051	-0.081	-0.038	-0.05	-0.23	0.0545	-0.111	-0.322	1		
RegSq	-0.198	-0.196	-0.309	-0.002	-0.424	0.0145	-0.281	-0.625	0.5086	1	
RegM	-0.029	0.0423	0.1971	0.0887	-0.012	-0.068	-0.021	-0.062	-0.058	-0.179	1

Non-State Conflict, 2002-2007 (CSP data)

7.3. Logistic Regression Time-Series Results in Coefficients

Onset	Coef.	Std. Err.	z	P>z	[95% Conf. Interval]
Refugees	.0505199	.0154538	3.27	0.001	.020231 .0808088
IMR	.0055486	.0015862	3.50	0.000	.0024397 .0086575
TotPopLn	.1941538	.0518421	3.75	0.000	.0925451 .2957624
Regime	.0039348	.013548	0.29	0.771	-.0226188 .0304884
RegimeSq	-.0153245	.0027685	-5.54	0.000	-.0207507 -.0098983
RegimeMiss	-2.283418	1.026361	-2.22	0.026	-4.295048 -.271787
BrevPeace	1.242742	.2998043	4.15	0.000	.6551359 1.830347
_cons	-5.231239	.5352178	-9.77	0.000	-6.280246 -4.182231

N = 5921, LR chi2(7) = 139.40, Prob > chi2 = 0.0000, Log likelihood = -718.94684, Pseudo R2 = 0.0884

Salehyan & Gleditsch data, basic model (coefficients). Conventional conflict.

Onset	Coef.	Std. Err.	z	P>z	[95%Conf. Interval]
Refugees	.0430273	.0173813	2.48	0.013	.0089606 .0770941
Potential C.	-.0192887	.0632243	-0.31	0.760	-.143206 .1046286
Aidpercap	.000323	.0028818	0.11	0.911	-.0053251 .0059711
RurPop	-.0012863	.0055138	-0.23	0.816	-.0120931 .0095205
IMR	.0073313	.0024982	2.93	0.003	.0024349 .0122278
TotPopLn	.2452529	.0682169	3.60	0.000	.1115503 .3789555
Regime	.003687	.0150751	0.24	0.807	-.0258596 .0332335
RegimeSq	-.0146209	.003015	-4.85	0.000	-.0205302 -.0087115
RegimeMiss	-1.280297	1.05535	-1.21	0.225	-3.348745 .7881513
BrevPeace	1.19367	.3252719	3.67	0.000	.5561491 1.831192
_cons	-5.642531	.7305966	-7.72	0.000	-7.074474 -4.210588

N = 4606, LR chi2(10) = 115.41, Prob > chi2 = 0.0000, Log likelihood = -596.69987, Pseudo R2 = 0.0882

Salehyan & Gleditsch data, all variables included (coefficients). Conventional conflict.

7.4. “Do-File” (STATA 9)

[Note: all commands yet not *all* run tests are shown below. This is particularly so for instance in relation to the alternative years checked in the cross-sectional analysis.]

```
*GETTING STARTED
clear
set mem 100m
use "M:\MINE DOKUMENTER\MASTER\final\odamain.dta", clear
rename countryname country
```

```

rename imr2 imr

*UPDATING POTENTIAL CROPLAND VARIABLE
gen temp = .
replace temp = u_prodarea if year == 2000
sort country year
by country: egen temp2 = mean(u_prodarea)
replace u_popdprod = 1000*totpop/temp2 if year > 2000

*NEW VARIABLES
*Make refugees (CSP) per capita
gen csppref_pc=csp_host/totpop

*Make refugees (Salehyan & Gleditsch) per capita
gen s_logttotrefh_pc= s_logttotrefh/totpop

*Make logtransformed CSP refugee data
gen csp_temp=csp_host
replace csp_temp=0.001 if csp_temp==0
gen csp_loghost=log(csp_temp)

* Make logtransformed potential cropland variable
gen u_popdprodln= ln(u_popdprod)

save "M:\MINE DOKUMENTER\MASTER\final\odamainEd.dta", replace
***** CORRELATIONS *****
***** ALL VARIABLES CORRELATION MATRIX *****
clear
set mem 100m
use "M:\MINE DOKUMENTER\MASTER\final\odamainEd.dta"

*(1) VARIABLE CORRELATION CSP REF. CONVENTIONAL CONFLICT

corr onset csp_loghost aidpercap u_popdprodln wup_prosrur totpopln
brevpeace imr polity politysq polmiss

corr onset csp_loghost aidpercap u_popdprodln wup_prosrur totpopln
brevpeace ksg_gdppc polity politysq polmiss

*(2) VARIABLE CORRELATION SALEHYAN & GLEDITSCH REF. CONVENTIONAL CONFLICT

corr onset s_logttotrefh aidpercap u_popdprodln wup_prosrur totpopln
brevpeace imr polity politysq polmiss

corr onset s_logttotrefh aidpercap u_popdprodln wup_prosrur totpopln
brevpeace ksg_gdppc polity politysq polmiss

*(3) VARIABLE CORRELATION CSP REF. NON-STATE CONFLICT

corr nonscinc csp_loghost aidpercap u_popdprodln wup_prosrur totpopln
brevpeace imr polity politysq polmiss

corr nonscinc csp_loghost aidpercap u_popdprodln wup_prosrur totpopln
brevpeace ksg_gdppc polity politysq polmiss
***** MODEL CORRELATION (correlation between coefficients) *****
*(1) CORRELATION MODEL REFUGEE DATA (CSP)

```

```
logistic onset csp_loghost totpopln brevpeace imr polity politysq polmiss
if !(onset==0 & incidence==1)
```

```
logistic onset csp_loghost totpopln brevpeace ksg_gdppc polity politysq
polmiss if !(onset==0 & incidence==1)
```

```
vce, corr
```

*(2) CORRELATION MODEL REFUGEE DATA (Salehyan & Gleditsch)

```
logit onset s_logtotrefh totpopln brevpeace imr polity politysq polmiss if
!(onset==0 & incidence==1), or
```

```
logit s_logtotrefh csp_host totpopln brevpeace ksg_gdppc polity politysq
polmiss if !(onset==0 & incidence==1), or
```

```
vce, corr
```

*(3) CORRELATION MODEL REFUGEE DATA, NON-STATE (CSP)

```
logit nonscinc csp_loghost totpopln brevpeace imr polity politysq polmiss,
or
```

```
logit nonscinc csp_loghost totpopln brevpeace ksg_gdppc polity politysq
polmiss, or
```

```
vce, corr
```

```
*****
*****
*****
***** BASIC MODELS *****
```

*(1) LOGISTIC BASIC MODEL 1.0. (conventional conflict, CSP ref data)

```
logistic onset csp_loghost imr totpopln polity politysq polmiss brevpeace
if !(onset==0 & incidence==1)
```

```
***
```

*(1) LOGISTIC ALTERNATIVE MODEL

*Contextual variables:

```
logistic onset csp_loghost u_popdprodln aidpercap wup_prosrur imr totpopln
polity politysq polmiss brevpeace if !(onset==0 & incidence==1)
```

*(2) LOGISTIC BASIC MODEL 2.0. (conventional conflict, Salehyan and Gleditsch ref data)

```
logistic onset s_logtotrefh imr totpopln polity politysq polmiss brevpeace
if !(onset==0 & incidence==1)
```

```
***
```

*(2) LOGISTIC ALTERNATIVE MODEL

*Contextual variables:

```
logistic onset s_logtotrefh u_popdprodln aidpercap wup_prosrur imr totpopln
polity politysq polmiss brevpeace if !(onset==0 & incidence==1)
```

```

*(3) LOGISTICBASIC MODEL 3.0. (non-state conflict, CSP ref data)

logistic nonscinc csp_loghost imr totpopln polity politysq polmiss
brevpeace

***

*(3) LOGISTIC ALTERNATIVE MODEL
*Contecstual variables:

logistic nonscinc csp_loghost u_popdprodln aidpercap wup_prosrur imr
totpopln polity politysq polmiss brevpeace
*****
***** MODELS WITH VARIABLES OF INTERACTION *****
*Run the following when appropriate:

*Goodness-of-fit test (-> Pearsons Chi square not appropriate)
lfit

*Goodness-of-fit test
lfit, group(10) table
*****
clear
set mem 100m
use "M:\MINE DOKUMENTER\MASTER\final\odamainEd.dta"

*(1) MODEL 1.1. (refugees & share of rural population)
*generate interaction
sum csp_loghost
gen csp_loghost_c=csp_loghost-1.655
sum wup_prosrur
gen wup_prosrur_c=wup_prosrur-55.223
gen csp_loghostprosrur=csp_loghost_c*wup_prosrur_c

*model with interaction
logistic onset csp_loghost_c csp_loghostprosrur wup_prosrur_c imr totpopln
polity politysq polmiss brevpeace if !(onset==0 & incidence==1)

logistic onset csp_loghost_c csp_loghostprosrur u_popdprodln aidpercap
wup_prosrur_c imr totpopln polity politysq polmiss brevpeace if !(onset==0
& incidence==1)

***

logistic onset csp_loghost_c csp_loghostprosrur wup_prosrur_c ksg_gdppc
totpopln polity politysq polmiss brevpeace if !(onset==0 & incidence==1)

logistic onset csp_loghost_c csp_loghostprosrur u_popdprodln aidpercap
wup_prosrur_c ksg_gdppc totpopln polity politysq polmiss brevpeace if
!(onset==0 & incidence==1)
*****
clear
set mem 100m
use "M:\MINE DOKUMENTER\MASTER\final\odamainEd.dta"

```

```

*(1) INTERACTION MODEL 1.2. (refugees & potential cropland)
*generate interaction
sum csp_loghost
gen csp_loghost_c=csp_loghost-1.655
sum u_popdprodln
gen u_popdprodln_c=u_popdprodln-4.177
gen csp_loghostpopdprod=csp_loghost_c*u_popdprodln_c

*model with interaction
logistic onset csp_loghost_c u_popdprodln_c csp_loghostpopdprod totpopln
polity politysq polmiss imr brevpeace if !(onset==0 & incidence==1)

logistic onset csp_loghost_c u_popdprodln_c csp_loghostpopdprod aidpercap
wup_prosrur totpopln polity politysq polmiss imr brevpeace if !(onset==0 &
incidence==1)

***

logistic onset csp_loghost_c u_popdprodln_c csp_loghostpopdprod totpopln
polity politysq polmiss ksg_gdppc brevpeace if !(onset==0 & incidence==1)

logistic onset csp_loghost_c u_popdprodln_c csp_loghostpopdprod aidpercap
wup_prosrur totpopln polity politysq polmiss ksg_gdppc brevpeace if
!(onset==0 & incidence==1)
*****
clear
set mem 100m
use "M:\MINE DOKUMENTER\MASTER\final\odamainEd.dta"

*(1) INTERACTION MODEL 1.3. (refugees & aid)
*generate interaction
sum aidpercap
gen aidpercap_c=aidpercap-27.697
sum csp_loghost
gen csp_loghost_c=csp_loghost-1.655
gen csp_loghostaidpercap=csp_loghost_c*(aidpercap_c*-1)

*model with interaction
logistic onset csp_loghost_c aidpercap_c csp_loghostaidpercap totpopln
polity politysq polmiss imr brevpeace if !(onset==0 & incidence==1)

logistic onset csp_loghost_c aidpercap_c csp_loghostaidpercap wup_prosrur
u_popdprodln totpopln polity politysq polmiss imr brevpeace if !(onset==0 &
incidence==1)

***

logistic onset csp_loghost_c aidpercap_c csp_loghostaidpercap totpopln
polity politysq polmiss ksg_gdppc brevpeace if !(onset==0 & incidence==1)

logistic onset csp_loghost_c aidpercap_c csp_loghostaidpercap wup_prosrur
u_popdprodln totpopln polity politysq polmiss ksg_gdppc brevpeace if
!(onset==0 & incidence==1)
*****
clear
set mem 100m
use "M:\MINE DOKUMENTER\MASTER\final\odamainEd.dta"

```

```

*(1) INTERACTION MODEL 1.4. (potential cropland & share of rural
population)
*generate interaction
sum u_popdprodln
gen u_popdprodln_c=u_popdprodln-4.177
sum wup_prosrur
gen wup_prosrur_c=wup_prosrur-55.223
gen prosrurpopdprod=(u_popdprodln_c*-1)*wup_prosrur_c

*model with interaction
logistic onset csp_loghost prosrurpopdprod u_popdprodln_c wup_prosrur_c imr
totpopln polity politysq polmiss brevpeace if !(onset==0 & incidence==1)

logistic onset csp_loghost prosrurpopdprod u_popdprodln_c aidpercap
wup_prosrur_c imr totpopln polity politysq polmiss brevpeace if !(onset==0
& incidence==1)

***

logistic onset csp_loghost prosrurpopdprod u_popdprodln_c wup_prosrur_c
ksg_gdppc totpopln polity politysq polmiss brevpeace if !(onset==0 &
incidence==1)

logistic onset csp_loghost prosrurpopdprod u_popdprodln_c aidpercap
wup_prosrur_c ksg_gdppc totpopln polity politysq polmiss brevpeace if
!(onset==0 & incidence==1)
*****
*****
clear
set mem 100m
use "M:\MINE DOKUMENTER\MASTER\final\odamainEd.dta"

*(2) INTERACTION MODEL 2.1. (refugees & share of rural population)
*generate interaction
sum s_logtotrefh
gen s_logtotrefh_c=s_logtotrefh-2.708
sum wup_prosrur
gen wup_prosrur_c=wup_prosrur-55.223
gen s_logtotrefhprosrur=s_logtotrefh_c*wup_prosrur_c

*model with interaction
logistic onset s_logtotrefh_c s_logtotrefhprosrur wup_prosrur_c imr
totpopln polity politysq polmiss brevpeace if !(onset==0 & incidence==1)

logistic onset s_logtotrefh_c s_logtotrefhprosrur u_popdprodln aidpercap
wup_prosrur_c imr totpopln polity politysq polmiss brevpeace if !(onset==0
& incidence==1)

***

logistic onset s_logtotrefh_c s_logtotrefhprosrur wup_prosrur_c ksg_gdppc
totpopln polity politysq polmiss brevpeace if !(onset==0 & incidence==1)

logistic onset s_logtotrefh_c s_logtotrefhprosrur u_popdprodln aidpercap
wup_prosrur_c ksg_gdppc totpopln polity politysq polmiss brevpeace if
!(onset==0 & incidence==1)
*****

```

```

clear
set mem 100m
use "M:\MINE DOKUMENTER\MASTER\final\odamainEd.dta"

*(2) INTERACTION MODEL 2.2. (refugees & potential cropland)
*generate interaction
sum s_logtotrefh
gen s_logtotrefh_c=s_logtotrefh-2.708
sum u_popdprodln
gen u_popdprodln_c=u_popdprodln-4.177
gen s_logtotrefhpopdprod=s_logtotrefh_c*u_popdprodln_c

*model with interaction
logistic onset s_logtotrefh_c u_popdprodln_c s_logtotrefhpopdprod totpopln
polity politysq polmiss imr brevpeace if !(onset==0 & incidence==1)

logistic onset s_logtotrefh_c u_popdprodln_c s_logtotrefhpopdprod aidpercap
wup_prosrur totpopln polity politysq polmiss imr brevpeace if !(onset==0 &
incidence==1)

***

logistic onset s_logtotrefh_c u_popdprodln_c s_logtotrefhpopdprod totpopln
polity politysq polmiss ksg_gdppc brevpeace if !(onset==0 & incidence==1)

logistic onset s_logtotrefh_c u_popdprodln_c s_logtotrefhpopdprod aidpercap
wup_prosrur totpopln polity politysq polmiss ksg_gdppc brevpeace if
!(onset==0 & incidence==1)
*****
clear
set mem 100m
use "M:\MINE DOKUMENTER\MASTER\final\odamainEd.dta"

*(2) INTERACTION MODEL 2.3. (refugees & aid)
*generate interaction
sum aidpercap
gen aidpercap_c=aidpercap-27.697
sum s_logtotrefh
gen s_logtotrefh_c=s_logtotrefh-2.708
gen s_logtotrefhaidpercap=s_logtotrefh_c*(aidpercap_c*-1)

*model with interaction
logistic onset s_logtotrefhaidpercap s_logtotrefh_c aidpercap_c aidpercap
totpopln polity politysq polmiss imr brevpeace if !(onset==0 &
incidence==1)

logistic onset s_logtotrefhaidpercap s_logtotrefh_c aidpercap_c wup_prosrur
u_popdprodln totpopln polity politysq polmiss imr brevpeace if !(onset==0 &
incidence==1)

***

logistic onset s_logtotrefhaidpercap s_logtotrefh_c aidpercap_c totpopln
polity politysq polmiss ksg_gdppc brevpeace if !(onset==0 & incidence==1)

```

```

logistic onset s_logtotrefhaidpercap s_logtotrefh_c aidpercap_c wup_prosrur
u_popdprodln totpopln polity politysq polmiss ksg_gdppc brevpeace if
!(onset==0 & incidence==1)
*****
clear
set mem 100m
use "M:\MINE DOKUMENTER\MASTER\final\odamainEd.dta"

*(2) INTERACTION MODEL 2.4. (potential cropland & share of rural
population)
*generate interaction
sum u_popdprodln
gen u_popdprodln_c=u_popdprodln-4.177
sum wup_prosrur
gen wup_prosrur_c=wup_prosrur-55.223
gen prosrurpopdprod=(u_popdprodln_c*-1)*wup_prosrur_c

*model with interaction
logistic onset s_logtotrefh prosrurpopdprod u_popdprodln_c wup_prosrur_c
imr totpopln polity politysq polmiss brevpeace if !(onset==0 &
incidence==1)

logistic onset s_logtotrefh prosrurpopdprod u_popdprodln_c aidpercap
wup_prosrur_c imr totpopln polity politysq polmiss brevpeace if !(onset==0
& incidence==1)

***

logistic onset s_logtotrefh prosrurpopdprod u_popdprodln_c wup_prosrur_c
ksg_gdppc totpopln polity politysq polmiss brevpeace if !(onset==0 &
incidence==1)

logistic onset s_logtotrefh prosrurpopdprod u_popdprodln_c aidpercap
wup_prosrur_c ksg_gdppc totpopln polity politysq polmiss brevpeace if
!(onset==0 & incidence==1)
*****
*****
clear
set mem 100m
use "M:\MINE DOKUMENTER\MASTER\final\odamainEd.dta"

*(3) INTERACTION MODEL 3.1. (refugees & share of rural population)
*generate interaction
sum csp_loghost
gen csp_loghost_c=csp_loghost-1.655
sum wup_prosrur
gen wup_prosrur_c=wup_prosrur-55.223
gen csp_loghostprosrur=csp_loghost_c*wup_prosrur_c

*model with interaction
logistic nonscinc csp_loghost_c csp_loghostprosrur wup_prosrur_c imr
totpopln polity politysq polmiss brevpeace

logistic nonscinc csp_loghost_c csp_loghostprosrur u_popdprodln aidpercap
wup_prosrur_c imr totpopln polity politysq polmiss brevpeace

***

```



```

logistic noncinc csp_loghost_c csp_loghostprosrur wup_prosrur_c ksg_gdppc
totpopln polity politysq polmiss brevpeace

logistic noncinc csp_loghost_c csp_loghostprosrur u_popdprodln aidpercap
wup_prosrur_c ksg_gdppc totpopln polity politysq polmiss brevpeace
*****
clear
set mem 100m
use "M:\MINE DOKUMENTER\MASTER\final\odamainEd.dta"

*(3) INTERACTION MODEL 3.2. (refugees & potential cropland)
*generate interaction
sum csp_loghost
gen csp_loghost_c=csp_loghost-1.655
sum u_popdprodln
gen u_popdprodln_c=u_popdprodln-4.177
gen csp_loghostpopdens=csp_loghost_c*u_popdprodln_c

*model with interaction
logistic noncinc csp_loghost_c u_popdprodln_c csp_loghostpopdens totpopln
polity politysq polmiss imr brevpeace

logistic noncinc csp_loghost_c u_popdprodln_c csp_loghostpopdens aidpercap
wup_prosrur totpopln polity politysq polmiss imr brevpeace

***

logistic noncinc csp_loghost_c u_popdprodln_c csp_loghostpopdens totpopln
polity politysq polmiss ksg_gdppc brevpeace

logistic noncinc csp_loghost_c u_popdprodln_c csp_loghostpopdens aidpercap
wup_prosrur totpopln polity politysq polmiss ksg_gdppc brevpeace
*****
clear
set mem 100m
use "M:\MINE DOKUMENTER\MASTER\final\odamainEd.dta"

*(3) INTERACTION MODEL 3.3. (refugees & aid)
*generate interaction
sum aidpercap
gen aidpercap_c=aidpercap-27.697
sum csp_loghost
gen csp_loghost_c=csp_loghost-1.655
gen csp_loghostaidpercap=csp_loghost_c*(aidpercap_c*-1)

*model with interaction
logistic noncinc csp_loghost_c aidpercap_c csp_loghostaidpercap totpopln
polity politysq polmiss imr brevpeace

logistic noncinc csp_loghost_c aidpercap_c csp_loghostaidpercap
wup_prosrur u_popdprodln totpopln polity politysq polmiss imr brevpeace

***

logistic noncinc csp_loghost_c aidpercap_c csp_loghostaidpercap totpopln
polity politysq polmiss ksg_gdppc brevpeace

```

```

logistic nonscinc csp_loghost_c aidpercap_c csp_loghostaidpercap
wup_prosrur u_popdprodln totpopln polity politysq polmiss ksg_gdppc
brevpeace
*****
clear
set mem 100m
use "M:\MINE DOKUMENTER\MASTER\final\odamainEd.dta"

*(3) INTERACTION MODEL 3.4. (potential cropland & share of rural
population)
*generate interaction
sum u_popdprodln
gen u_popdprodln_c=u_popdprodln-4.177
sum wup_prosrur
gen wup_prosrur_c=wup_prosrur-55.223
gen prosrurpopdprod=(u_popdprodln_c*-1)*wup_prosrur_c

*model with interaction
logistic nonscinc csp_loghost prosrurpopdprod u_popdprodln_c wup_prosrur_c
imr totpopln polity politysq polmiss brevpeace

logistic nonscinc csp_loghost prosrurpopdprod u_popdprodln_c aidpercap
wup_prosrur_c imr totpopln polity politysq polmiss brevpeace

***

logistic nonscinc csp_loghost prosrurpopdprod u_popdprodln_c wup_prosrur_c
ksg_gdppc totpopln polity politysq polmiss brevpeace

logistic nonscinc csp_loghost prosrurpopdprod u_popdprodln_c aidpercap
wup_prosrur_c ksg_gdppc totpopln polity politysq polmiss brevpeace
*****
clear
set mem 100m
use "M:\MINE DOKUMENTER\MASTER\final\odamainEd.dta"

*(3) INTERACTION MODEL 3.5. (potential cropland & aid)
*generate interaction
sum u_popdprodln
gen u_popdprodln_c=u_popdprodln-4.177
sum aidpercap
gen aidpercap_c=aidpercap-27.697
gen popdprodaid=(u_popdprodln_c*-1)*(aidpercap_c*-1)

logistic nonscinc csp_loghost popdprodaid u_popdprodln_c wup_prosrur
aidpercap_c imr totpopln polity politysq polmiss brevpeace

*****
***** CROSS-SECTIONAL ANALYSIS *****
clear
set mem 100m
use "M:\MINE DOKUMENTER\MASTER\final\odamainEd.dta"

*(1) CROSS-SECTIONAL BASIC MODEL 1.0. (conventional conflict, CSP ref data)

```

```
logistic onset csp_loghost imr totpopln polity politysq polmiss brevpeace
if !(onset==0 & incidence==1) & year==2007
```

```
*(1) CROSS-SECTIONAL ALTERNATIVE MODEL
*Contecstual variables (minus aid):
```

```
logistic onset csp_loghost u_popdprodln wup_prosrur imr totpopln polity
politysq polmiss brevpeace if !(onset==0 & incidence==1) & year==2007
```

```
*(2) CROSS-SECTIONAL BASIC MODEL 2.0. (conventional conflict, Salehyan and
Gleditsch ref data)
```

```
logistic onset s_logtotrefh imr totpopln polity politysq polmiss brevpeace
if !(onset==0 & incidence==1) & year==2001
```

```
*(2) CROSS-SECTIONAL ALTERNATIVE MODEL
*Contecstual variables (minus aid):
```

```
logistic onset s_logtotrefh u_popdprodln wup_prosrur imr totpopln polity
politysq polmiss brevpeace if !(onset==0 & incidence==1) & year==2001
```

```
*(3) CROSS-SECTIONAL BASIC MODEL 3.0. (non-state conflict, CSP ref data)
```

```
logistic nonscinc csp_loghost imr totpopln polity politysq polmiss
brevpeace if year==2007
```

```
*(3) CROSS-SECTIONAL ALTERNATIVE MODEL
*Contecstual variables (minus aid):
```

```
logistic nonscinc csp_loghost u_popdprodln wup_prosrur imr totpopln polity
politysq polmiss brevpeace if year==2007
```

```
*****
***** CROSS-SECTIONAL INTERACTION *****
```

```
clear
```

```
set mem 100m
```

```
use "M:\MINE DOKUMENTER\MASTER\final\odamainEd.dta"
```

```
*(1) CROSS-SECTIONAL INTERACTION CSP CONVENTIONAL MODEL 1.1. (refugees &
share of rural population)
```

```
*generate interaction
```

```
sum csp_loghost
```

```
gen csp_loghost_c=csp_loghost-1.655
```

```
sum wup_prosrur
```

```
gen wup_prosrur_c=wup_prosrur-55.223
```

```
gen csp_loghostprosrur=csp_loghost_c*wup_prosrur_c
```

```
*model with interaction
```

```
logistic onset csp_loghost_c csp_loghostprosrur wup_prosrur_c imr totpopln
polity politysq polmiss brevpeace if !(onset==0 & incidence==1) &
year==2007
```

```
*****
```

```
clear
```

```
set mem 100m
```

```
use "M:\MINE DOKUMENTER\MASTER\final\odamainEd.dta"
```

```

*(1) CROSS-SECTIONAL INTERACTION CSP CONVENTIONAL MODEL 1.2. (refugees &
potential cropland)
*generate interaction
sum csp_loghost
gen csp_loghost_c=csp_loghost-1.655
sum u_popdprodln
gen u_popdprodln_c=u_popdprodln-4.177
gen csp_loghostpopdprod=csp_loghost_c*u_popdprodln_c

```

```

*model with interaction
logistic onset csp_loghost_c u_popdprodln_c csp_loghostpopdprod totpopln
polity politysq polmiss imr brevpeace if !(onset==0 & incidence==1) &
year==2007
*****
clear
set mem 100m
use "M:\MINE DOKUMENTER\MASTER\final\odamainEd.dta"

```

```

*(1) CROSS-SECTIONAL INTERACTION CSP CONVENTIONAL MODEL 1.3. (refugees &
aid)
*generate interaction
sum aidpercap
gen aidpercap_c=aidpercap-27.697
sum csp_loghost
gen csp_loghost_c=csp_loghost-1.655
gen csp_loghostaidpercap=csp_loghost_c*(aidpercap_c*-1)

```

```

*model with interaction
logistic onset csp_loghost_c aidpercap_c csp_loghostaidpercap totpopln
polity politysq polmiss imr brevpeace if !(onset==0 & incidence==1) &
year==2007
*****
clear
set mem 100m
use "M:\MINE DOKUMENTER\MASTER\final\odamainEd.dta"

```

```

*(1) CROSS-SECTIONAL INTERACTION CSP CONVENTIONAL MODEL 1.4. (potential
cropland & share of rural population)
*generate interaction
sum u_popdprodln
gen u_popdprodln_c=u_popdprodln-4.177
sum wup_prosrur
gen wup_prosrur_c=wup_prosrur-55.223
gen prosrurpopdprod=(u_popdprodln_c*-1)*wup_prosrur_c

```

```

*model with interaction
logistic onset csp_loghost prosrurpopdprod u_popdprodln_c wup_prosrur_c imr
totpopln polity politysq polmiss brevpeace if !(onset==0 & incidence==1) &
year==2003
*****
clear
set mem 100m
use "M:\MINE DOKUMENTER\MASTER\final\odamainEd.dta"

```

```

*(2) CROSS-SECTIONAL INTERACTION S&G CONVENTIONAL MODEL 2.1. (refugees &
share of rural population)
*generate interaction
sum s_logtotrefh
gen s_logtotrefh_c=s_logtotrefh-2.708
sum wup_prosrur
gen wup_prosrur_c=wup_prosrur-55.223
gen s_logtotrefhprosrur=s_logtotrefh_c*wup_prosrur_c

*model with interaction
logistic onset s_logtotrefh_c s_logtotrefhprosrur wup_prosrur_c imr
totpopln polity politysq polmiss brevpeace if !(onset==0 & incidence==1) &
year==2001
*****
clear
set mem 100m
use "M:\MINE DOKUMENTER\MASTER\final\odamainEd.dta"

*(2) CROSS-SECTIONAL INTERACTION S&G CONVENTIONAL MODEL 2.2. (refugees &
potential cropland)
*generate interaction
sum s_logtotrefh
gen s_logtotrefh_c=s_logtotrefh-2.708
sum u_popdprodln
gen u_popdprodln_c=u_popdprodln-4.177
gen s_logtotrefhpopdprod=s_logtotrefh_c*u_popdprodln_c

*model with interaction
logistic onset s_logtotrefh_c u_popdprodln_c s_logtotrefhpopdprod totpopln
polity politysq polmiss imr brevpeace if !(onset==0 & incidence==1) &
year==2001
*****
clear
set mem 100m
use "M:\MINE DOKUMENTER\MASTER\final\odamainEd.dta"

*(2) CROSS-SECTIONAL INTERACTION S&G CONVENTIONAL MODEL 2.3. (refugees &
aid)
*generate interaction
sum aidpercap
gen aidpercap_c=aidpercap-27.697
sum s_logtotrefh
gen s_logtotrefh_c=s_logtotrefh-2.708
gen s_logtotrefhaidpercap=s_logtotrefh_c*(aidpercap_c-1)

*model with interaction
logistic onset s_logtotrefh_c aidpercap_c s_logtotrefhaidpercap totpopln
polity politysq polmiss imr brevpeace if !(onset==0 & incidence==1) &
year==2001
*****
clear
set mem 100m
use "M:\MINE DOKUMENTER\MASTER\final\odamainEd.dta"

```

```

*(2) CROSS-SECTIONAL INTERACTION S&G CONVENTIONAL MODEL 2.4. (potential
cropland & share of rural population)
*generate interaction
sum u_popdprodln
gen u_popdprodln_c=u_popdprodln-4.177
sum wup_prosrur
gen wup_prosrur_c=wup_prosrur-55.223
gen prosrurpopdprod=(u_popdprodln_c*-1)*wup_prosrur_c

*model with interaction
logistic onset s_logtotrefh prosrurpopdprod u_popdprodln_c wup_prosrur_c
imr totpopln polity politysq polmiss brevpeace if !(onset==0 &
incidence==1) & year==2001
*****
clear
set mem 100m
use "M:\MINE DOKUMENTER\MASTER\final\odamainEd.dta"

*(3) CROSS-SECTIONAL MODEL CSP NON-STATE 3.1. (refugees & share of rural
population)
*generate interaction
sum csp_loghost
gen csp_loghost_c=csp_loghost-1.655
sum wup_prosrur
gen wup_prosrur_c=wup_prosrur-55.223
gen csp_loghostprosrur=csp_loghost_c*wup_prosrur_c

*model with interaction
logistic nonscinc csp_loghost_c csp_loghostprosrur wup_prosrur_c imr
totpopln polity politysq polmiss brevpeace if year==2007
*****
clear
set mem 100m
use "M:\MINE DOKUMENTER\MASTER\final\odamainEd.dta"

*(3) CROSS-SECTIONAL MODEL CSP NON-STATE 3.2. (refugees & potential
cropland)
*generate interaction
sum csp_loghost
gen csp_loghost_c=csp_loghost-1.655
sum u_popdprodln
gen u_popdprodln_c=u_popdprodln-4.177
gen csp_loghostpopdprod=csp_loghost_c*u_popdprodln_c

*model with interaction
logistic nonscinc csp_loghost_c u_popdprodln_c csp_loghostpopdprod totpopln
polity politysq polmiss imr brevpeace if year==2007
*****
clear
set mem 100m
use "M:\MINE DOKUMENTER\MASTER\final\odamainEd.dta"

*(3) CROSS-SECTIONAL MODEL CSP NON-STATE 3.3. (refugees & aid)
*generate interaction

```

```

sum aidpercap
gen aidpercap_c=aidpercap-27.697
sum csp_loghost
gen csp_loghost_c=csp_loghost-1.655
gen csp_loghostaidpercap=csp_loghost_c*(aidpercap_c*-1)

*model with interaction
logistic nonscinc csp_loghost_c aidpercap_c csp_loghostaidpercap totpopln
polity politysq polmiss imr brevpeace if year==2007
*****
clear
set mem 100m
use "M:\MINE DOKUMENTER\MASTER\final\odamainEd.dta"

*(3) CROSS-SECTIONAL MODEL CSP NON-STATE 3.4. (potential cropland & share
of rural population)
*generate interaction
sum u_popdprodln
gen u_popdprodln_c=u_popdprodln-4.177
sum wup_prosrur
gen wup_prosrur_c=wup_prosrur-55.223
gen prosrurpopdprod=(u_popdprodln_c*-1)*wup_prosrur_c

*model with interaction
logistic nonscinc csp_loghost prosrurpopdprod u_popdprodln_c wup_prosrur_c
imr totpopln polity politysq polmiss brevpeace if year==2007
*****
***** DESCRIPTIVE STATISTICS *****
sum onset if !(onset==0 & incidence==1)

sum nonscinc
*****
***** POST 1999 *****
clear
set mem 100m
use "M:\MINE DOKUMENTER\MASTER\final\odamainEd.dta"

*(1) LOGISTIC BASIC MODEL 1.0. (conventional conflict, CSP ref data)

logistic onset csp_loghost imr totpopln polity politysq polmiss brevpeace
if !(onset==0 & incidence==1) & year > 1999

***

*(1) LOGISTIC ALTERNATIVE MODEL
*Contecstual variables:

logistic onset csp_loghost u_popdprodln aidpercap wup_prosrur imr totpopln
polity politysq polmiss brevpeace if !(onset==0 & incidence==1) & year >
1999

*(2) LOGISTIC BASIC MODEL 2.0. (conventional conflict, Salehyan and
Gleditsch ref data)

```

```
logistic onset s_logtotrefh imr totpopln polity politysq polmiss brevpeace  
if !(onset==0 & incidence==1) & year > 1999
```

*(2) LOGISTIC ALTERNATIVE MODEL

*Contextual variables:

```
logistic onset s_logtotrefh u_popdprodln aidpercap wup_prosrur imr totpopln  
polity politysq polmiss brevpeace if !(onset==0 & incidence==1) & year >  
1999
```